Successful Methods

McGraw-Hill Publishing Company, Inc.
JAMES H. MCGRAW, *President*
E. J. MEHREN, *Vice-President*

A Monthly Pictorial of Field Practice and Equipment

GENERAL CONSTRUCTION — HIGHWAYS — BUILDINGS
ENGINEERING — INDUSTRIAL

WILLIAM JABINE
Editor

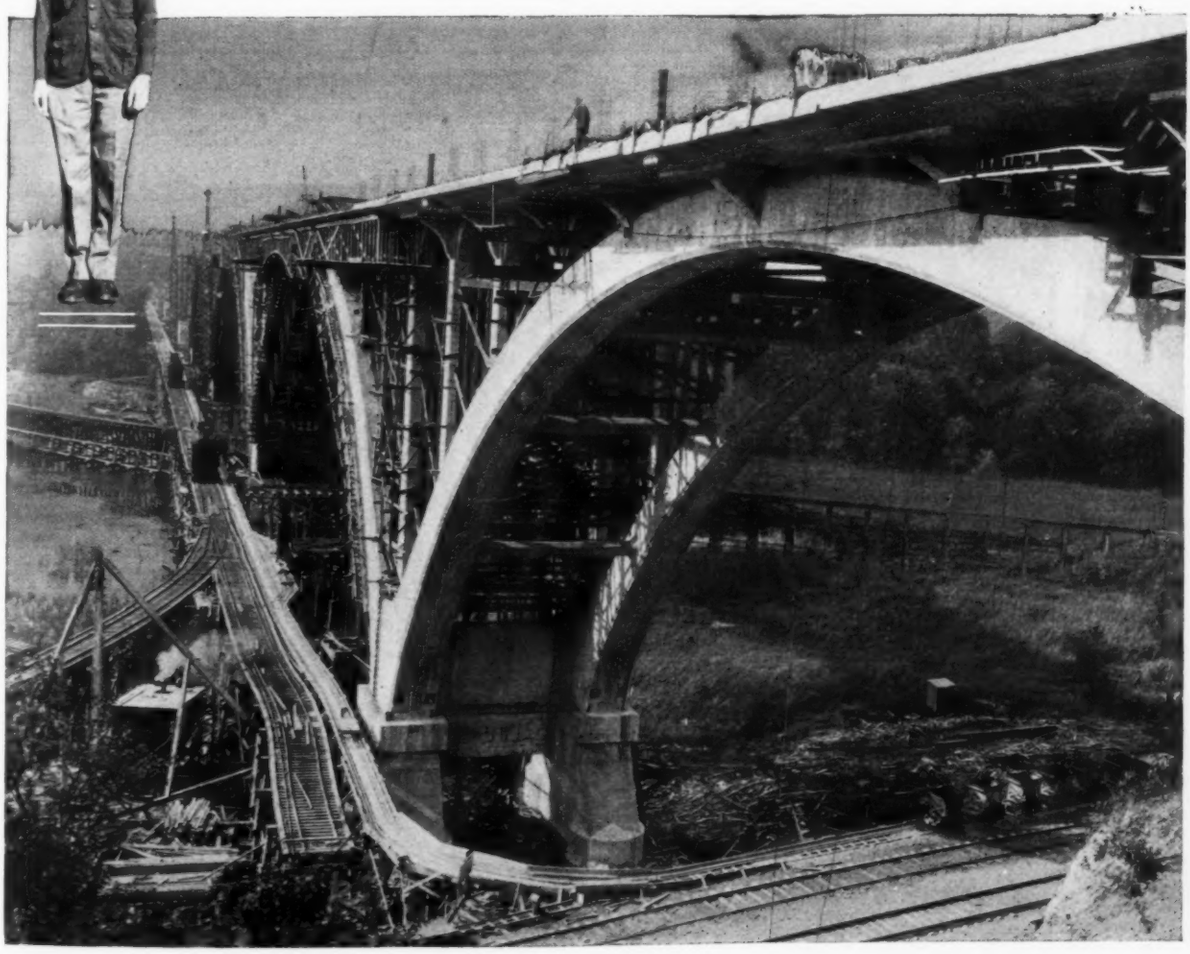
VOLUME 8 NEW YORK, AUGUST, 1926 NUMBER 8

The Prize Winner

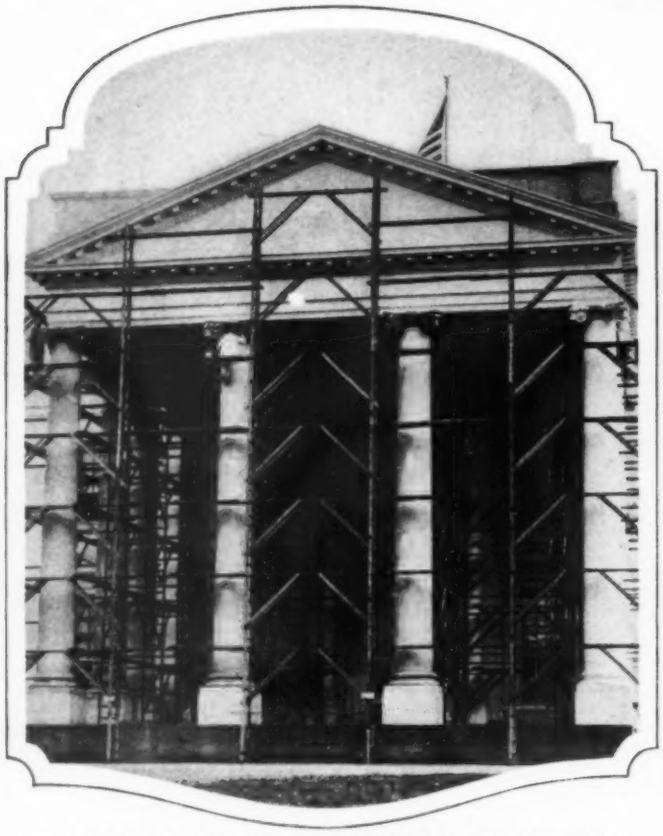
THE photograph which is reproduced on this page is the winner of the first of the series of monthly photographic contests which begins with this issue of *Successful Methods*. The prize of $25.00 for the picture best suited to the needs of this magazine has been awarded this month to E. J. McKenzie of St. Paul, Minnesota, whose photograph appears at the left. Mr. McKenzie is an inspector employed on the Fort Snelling-Mendota bridge which is the subject of the prize winning photograph.

A large number of photographs were entered and after considerable deliberation Mr. McKenzie's was selected as the winner.

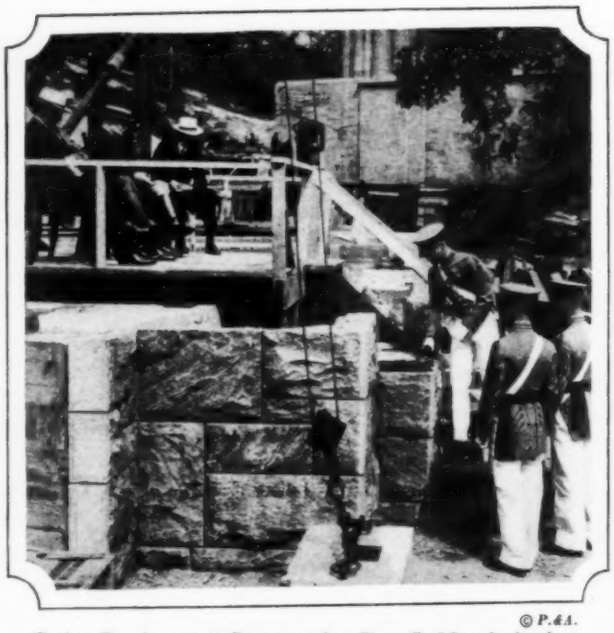
Details of the conditions of the photographic contest for the September prize appears on pages 14 and 15 of this issue.



Two Nations Entrust

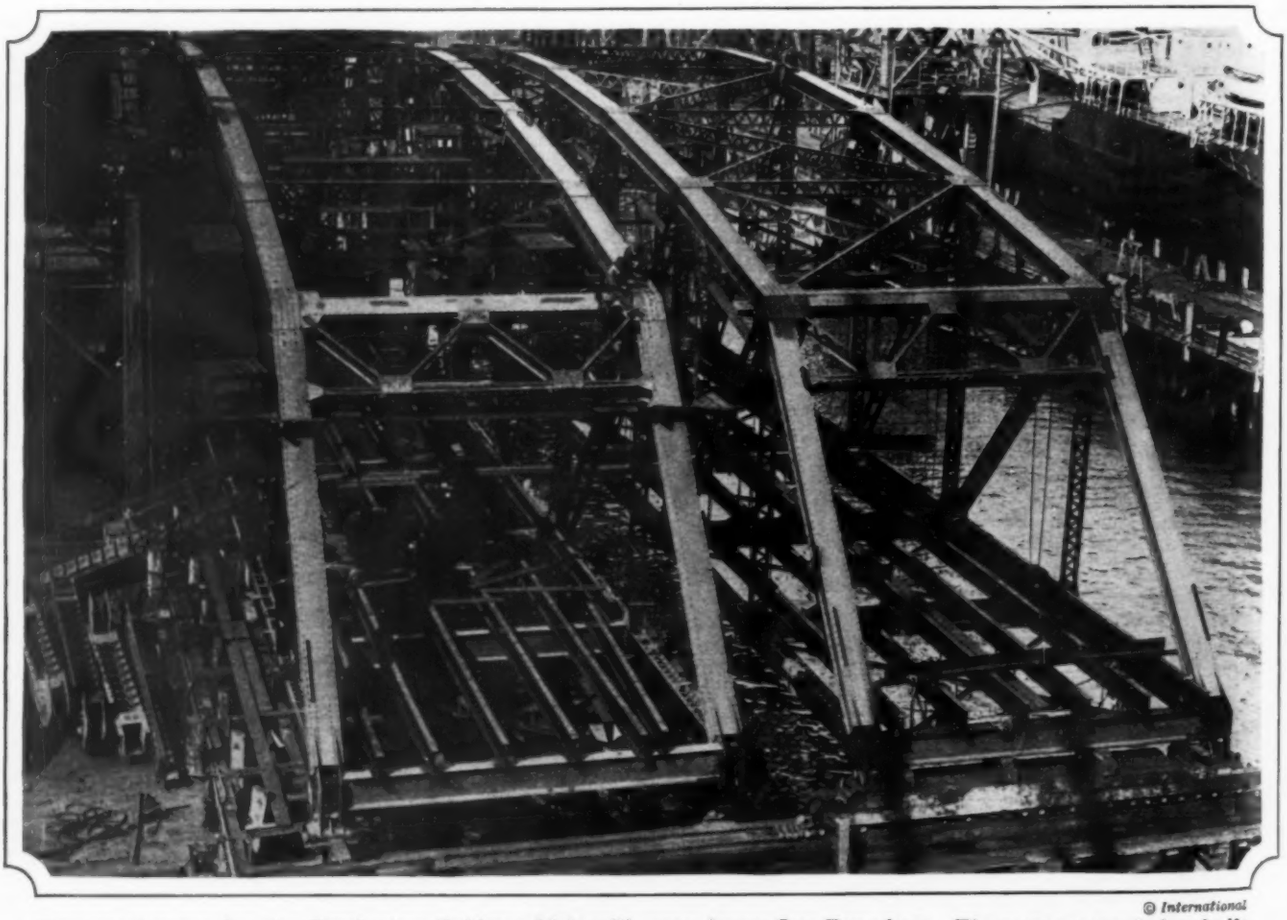


Before the President was out of Washington, the work of refurbishing the White House was begun



© P.&A.

Cadet Regimental Commander Ray C. Maude laying the cornerstone of the new mess hall at West Point in the presence of the Assistant Secretary of War and a trio of generals



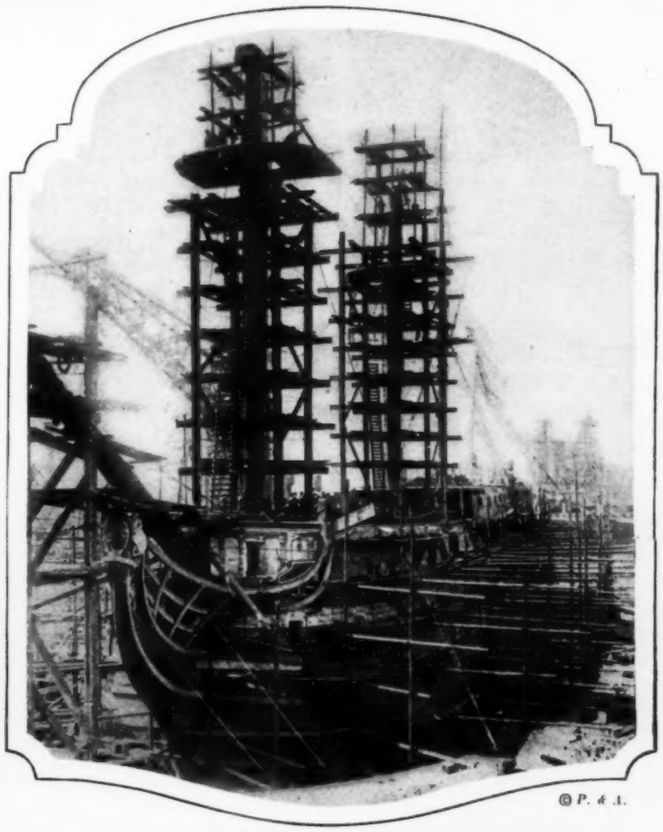
© International

Two steel spans for the Dumbarton Bridge which will cross lower San Francisco. These spans are being built in an Oakland shipyard and will be towed on barges to the site of the new bridge. They are 230 ft. long and 30 ft. wide

Shrines to Builders

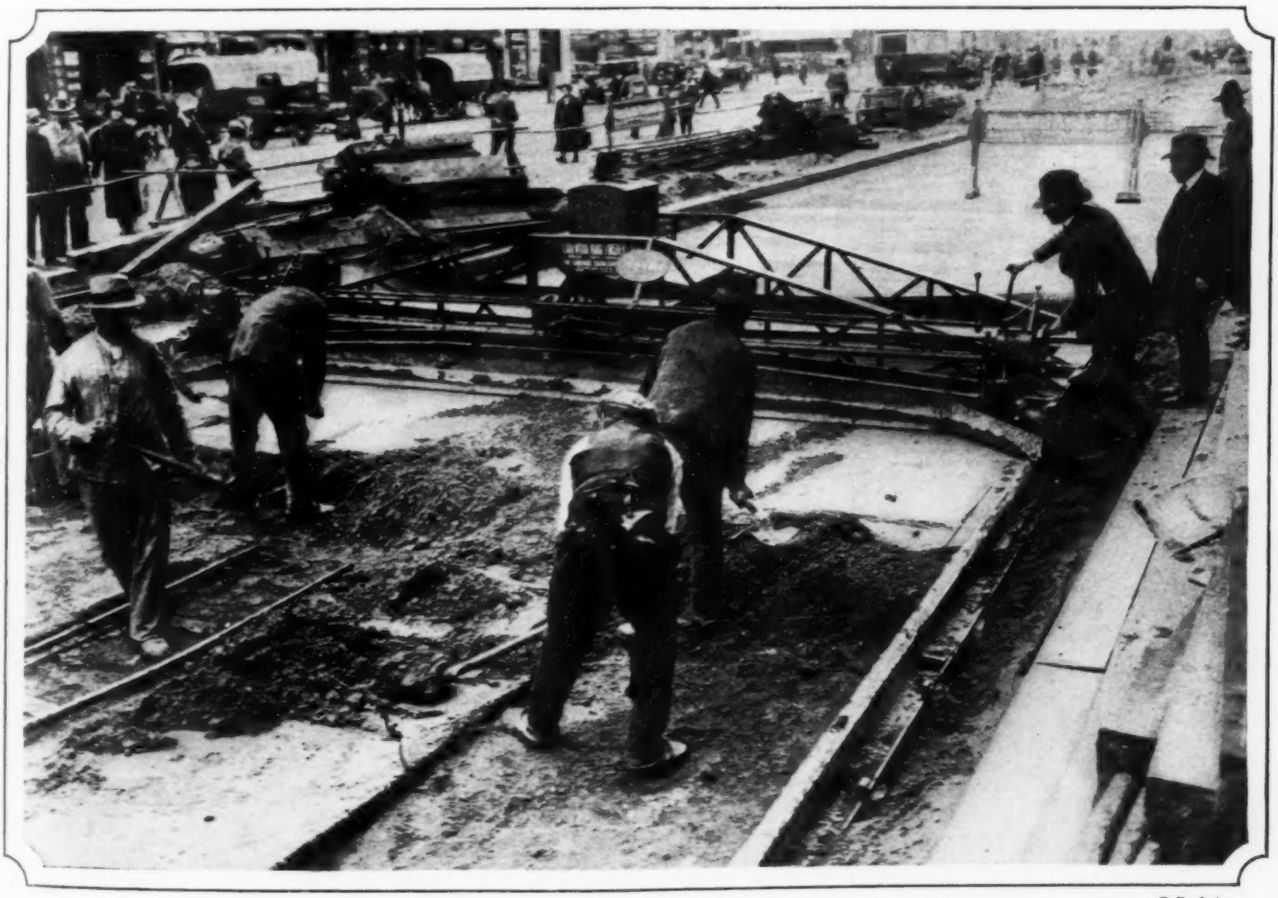
© International.

A 6-camel power road roller on an African highway



© P. & A.

The construction industry has taken charge of Lord Nelson's famous flagship, Victory, for a while. This photograph shows her in Portsmouth dockyard surrounded by scaffolding



© P. & A.

An American finishing machine has attracted considerable attention in Berlin, where it has been doing excellent work. The machine shown in this photograph is finishing the sub-base for an asphalt road

Concrete Bridge Spans Wide Valley

Twelve Arches of Equal Length Will Support Four Thousand Foot Structure

By E. J. McKenzie

THE Snelling-Mendota bridge will be a 13-span concrete arch structure with a 45-ft. roadway flanked by two 6-ft. walks. It will be one of the longest concrete bridges in the world, 4,119 ft. in length, and will be the only one of similar construction with twelve spans of equal size. It will reach from Fort Snelling to Mendota, crossing the glacial river, Warren, of which the present Minnesota River is but a shadow. The concrete bridge will weigh 148,000 tons.

The work of sinking the 70-ft. cylindrical steel and concrete caissons is carried on by the open dredge method. The caissons are sunk by their own weight through 70 ft. of mud to bed rock foundation. These caissons are sunk a section at a time. The first section consists of a riveted structural steel frame with a cutting edge. The bell-shaped center is left hollow and after the caisson reaches position, this hollow section is filled with concrete. At the bottom the caissons are 22 ft. in diameter, outside measurements. Thirteen feet from the bottom is an offset of 4 ft. all around, and at the top, the caissons measure 14 ft. with an inside diameter of 10 ft. Reinforcing consists of 1⅛-in. bars fastened with U-bolts. After the caissons are sunk, mud is forced through the hollow center and this is dug out by locomotive cranes, using either a clamshell or an orange peel bucket. This takes great skill in order accurately to place the bucket with speed and get a full bite each trip.

Before the work could be started on this bridge, it was necessary to build a timber trestle across the river and marsh parallel to the line of the bridge to be constructed. This trestle consumed 1,000,000 ft. of timber, and consisted of piling and false work.

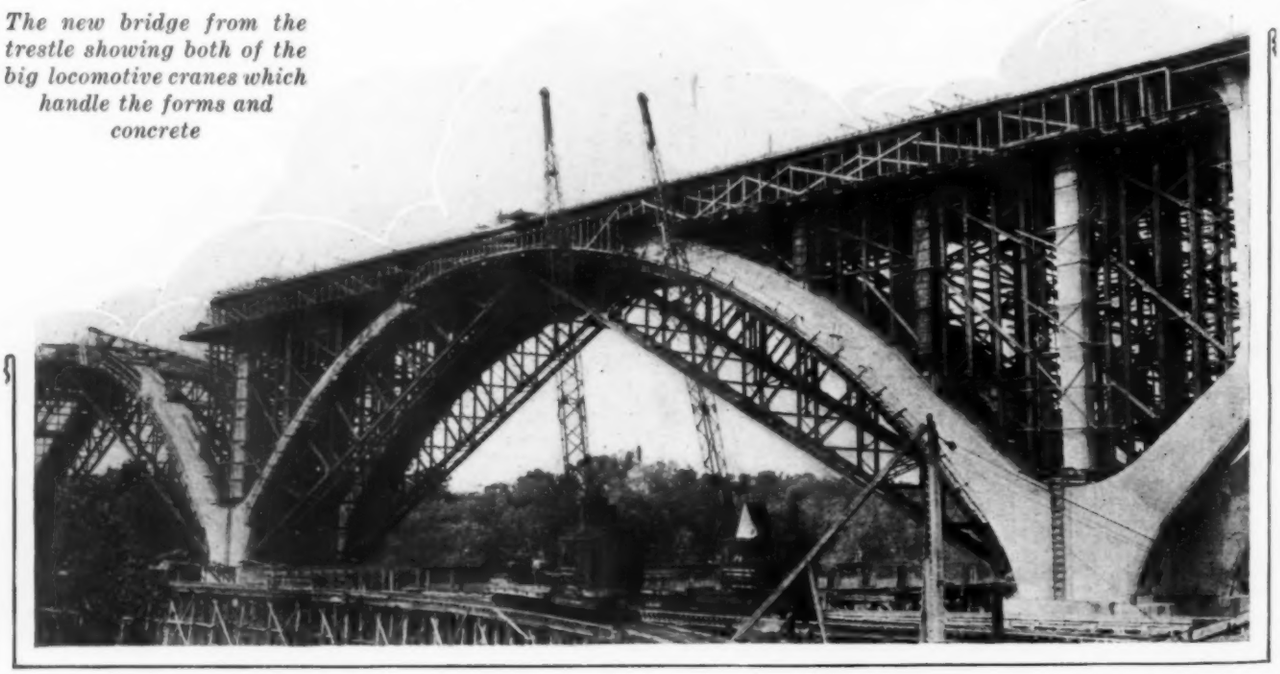
The concrete is mixed in a plant on the bluffs on the south side of the valley. This concrete is chuted to a train of narrow-gage cars which operate on the trestle beside the bridge. The two large cranes shown in the various photographs pick up these cars and either dump the concrete directly into the forms or place them on platforms from which other sections of the form work can be reached.

For many years a hand-operated ferry has been the only means of crossing to Mendota from Fort Snelling, and in contrast, this new bridge will be a great improvement, consisting of 13 open spandrel-ribbed arches, each of which will be 304 ft. long with two ribs to each arch and with slab approaches at the Fort Snelling end. The completed structure will be 125 ft. above the water level of the Minnesota River.

The structure when finished will contain 75,000 cu.yd. of concrete and will have about 300,000 ft. of concrete facing. The false work will consist of approximately 1,000,000 ft. of timber with an additional million feet of timber going into the work trestle which runs parallel to the line of the bridge.

The contractors for this job were the Koss Construction Company, of Des Moines, Iowa. The contract price is $1,700,000 and work was started on May 1, 1924. It is expected that the bridge will be completed about October of this year. Frank Kratoska is superintendent for the Koss Construction Company, W. H. DeButts is resident engineer, and R. S. Parker is material man.

The new bridge from the trestle showing both of the big locomotive cranes which handle the forms and concrete



The steel centering which is used to support the concrete arches during construction is plainly shown in this photograph. Steel centering instead of wood was decided upon because of the great weight of the structure. One of the locomotive cranes in the center of the photograph is lifting a form into place. Part of the mixing plant may be seen at the extreme left of the photograph under the arch

A Road Builders' Lineup

Five Contractors Are at Work on Widening and Resurfacing Jobs Along Twenty-five Mile Section of Highway Through Edge of Adirondacks

FIVE contractors are working this summer in northeastern New York on State Highway No. 6 which leads from the Canadian border along Lake Champlain, through the edge of the Adirondacks, and then down the Hudson Valley to New York. These five contractors are engaged in resurfacing approximately 25 miles of road with bituminous macadam 18 ft. in width and all five contracts lie between Chestertown and Elizabethtown, a distance of a little more than 30 miles. About 5 miles of road north of Schroon Lake are not being resurfaced this year.

The first course of the new surface

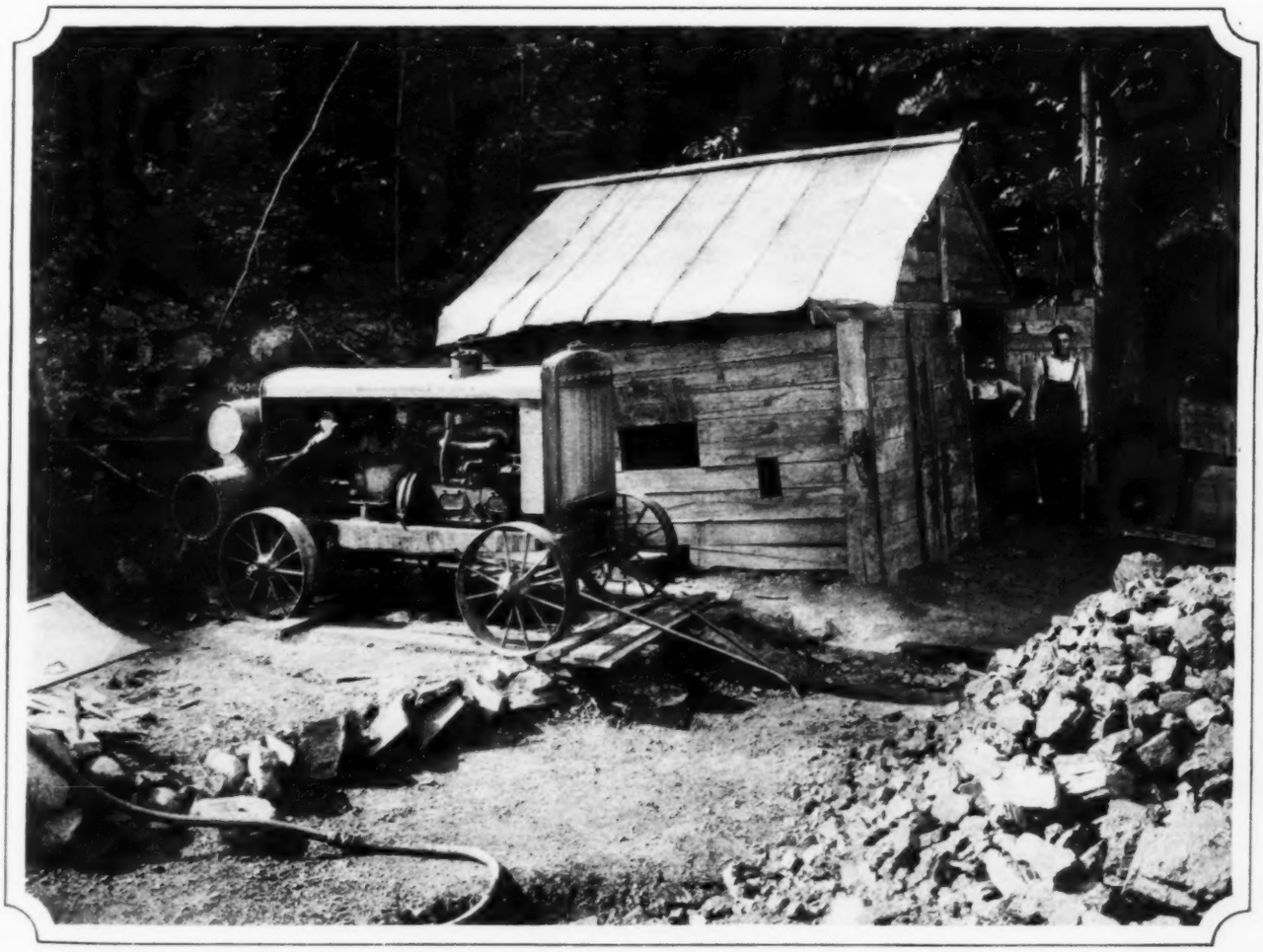
Beginning at the Chestertown end and going north, the five contractors in the order in which they are working are: Kemp Brothers Construction Co. of Langdon, Minn., who have about 5 miles between Loon Lake and Pottersville; Louis Longhi & Son of Torrington, Conn., who have about 4 miles north of Pottersville; Louis Mayersohn of Albany, N. Y., who is building 5 miles in the vicinity of Schroon Lake Village; Ryan Bros. & Campo of Danville, N. Y., who have a 3-mile contract from North Hudson to New Russia, and Nathan E. Young who is building 7½ miles of road from New Russia to Elizabethtown.

With five contractors, two of them from other states, all doing the same sort of work in the same sort of country, an excellent opportunity is afforded to compare

A. P. Ryan with his quarry and crusher

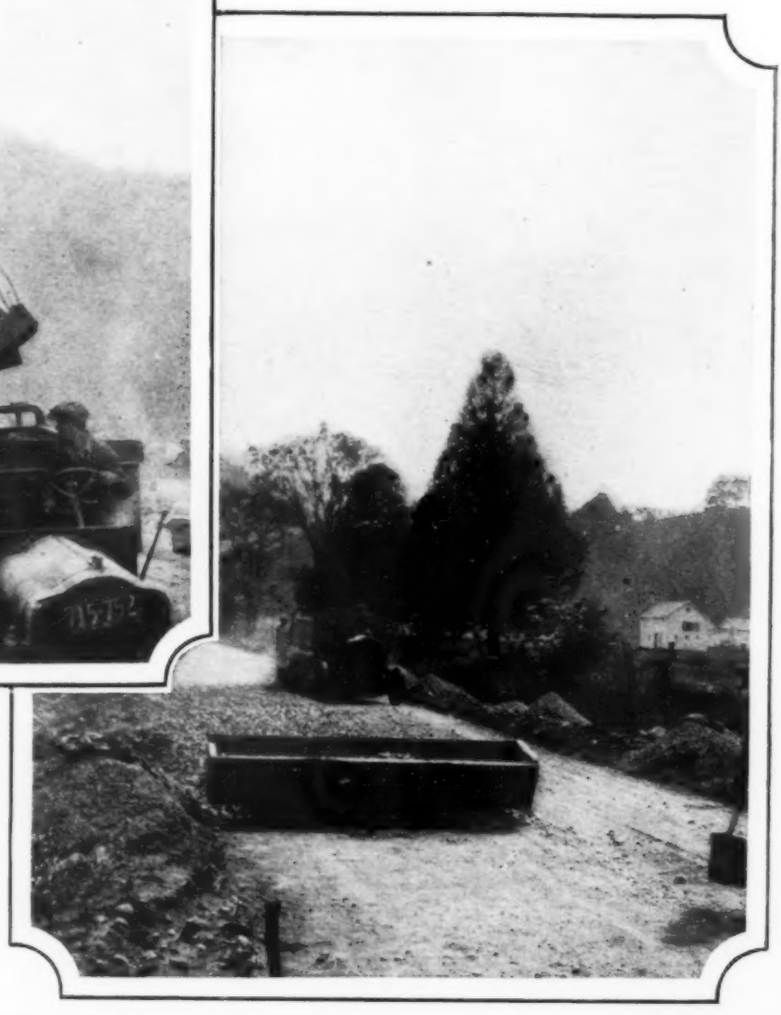
Sharpening drills in Mayersohn's blacksmith shop

This veteran is on the move all day



The compressor works away beside the shop

Loading truck with carefully graded stone on N. E. Young's job



Spreaders are attached to rear of trucks and make it easy to lay crushed stone smoothly

Curves like this are being eliminated all along Route No. 6. The new road will be at the left directly behind the warning sign

methods of handling jobs. All sorts of equipment may be seen on the five jobs. In fact, the only point on which all five contractors agree seems to be in the use of Ingersoll-Rand compressors and air tools for the rock excavation, including, of course, the quarrying which is necessary to get out the stone which is to be used in surfacing the road. They seem to be standard.

Probably the most interesting job of the lot is that being done by Ryan Bros. & Campo. They have selected

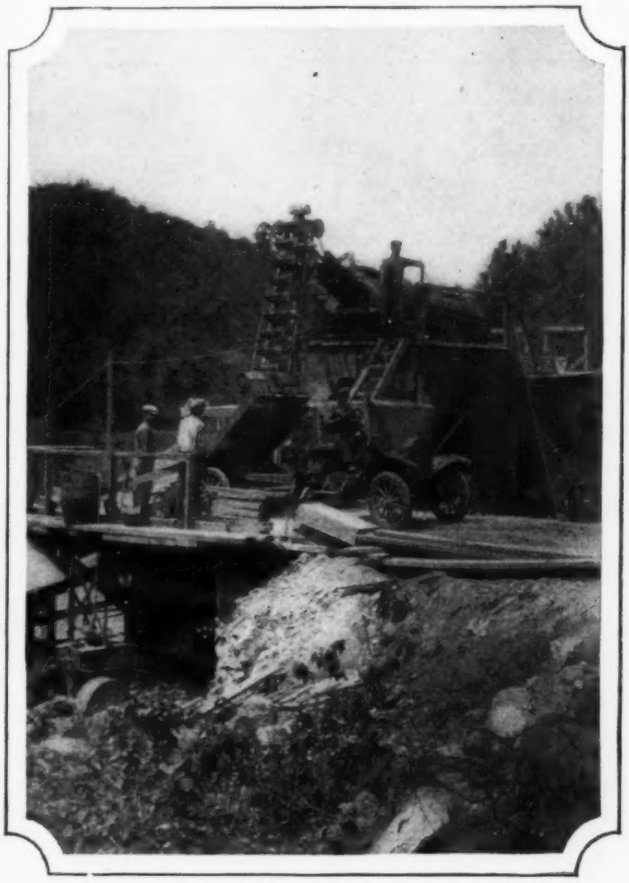
Every additional foot of width means cutting through rock

an unusual quarry site on the bank of a mountain stream which is shown in the photograph at the bottom of page 8. The rock which they are getting out towers perpendicularly about 100 ft. above the roadside and they have been chipping off the top of this cliff and dropping the rock into the pit of the quarry below. Another indication of the difficulties under which the Ryan & Campo organization has been working is shown in the small photograph on page 8. In widening the old road a number of large boulders were encountered and at the suggestion of the district engineer of the highway department, it was decided to set them up at the side of the road instead of using guard rail. A line of these boulders may be seen at the right.

The photographs on page 9 were taken on Louis Mayersohn's job and show three views of his blacksmith shop. The upper view shows the drill sharpener at work and at the right the Ford car which is kept moving from one end of the job to the other collecting drills and bringing them to the shop for resharpening. The large view at the bottom of the page shows the exterior of the shop.

Surfacing operations on Nathan Young's job are shown in the photographs on page 10. He is getting the rock out of the hillside about 600 ft. from his crusher and running it down to the crusher in small cars. The upper photographs show a truck being loaded at the crusher and the same truck depositing its load of crushed stone on the road about one-half mile away. The box-like object in the foreground is a spreader which is attached at the back of the truck and through which the stone passes. Another spreader is attached to the truck in the photograph, and a man may be seen standing on it and operating it as the truck moves along.

The lower picture gives a good idea of the sort of work which is being done on all five contracts. A



Kemp Brothers' crushing plant is an up-to-date outfit

curve is being eliminated by digging the road through a hillside where a steam shovel may be seen at work. A large proportion of the rock excavation on all of the jobs now under way is necessary because of curve elimination of this kind. In addition the widening of the road makes it necessary to remove considerable rock, and scenes like that in the left-hand photograph on page 11 are frequent all along the 25 miles of road.

One of the most up-to-date crushing plants in operation on any of the jobs is being run by Kemp Brothers who sublet their work from S. J. Groves & Sons Co. It is shown in the right hand photograph on this page.

Dug By a Ditcher

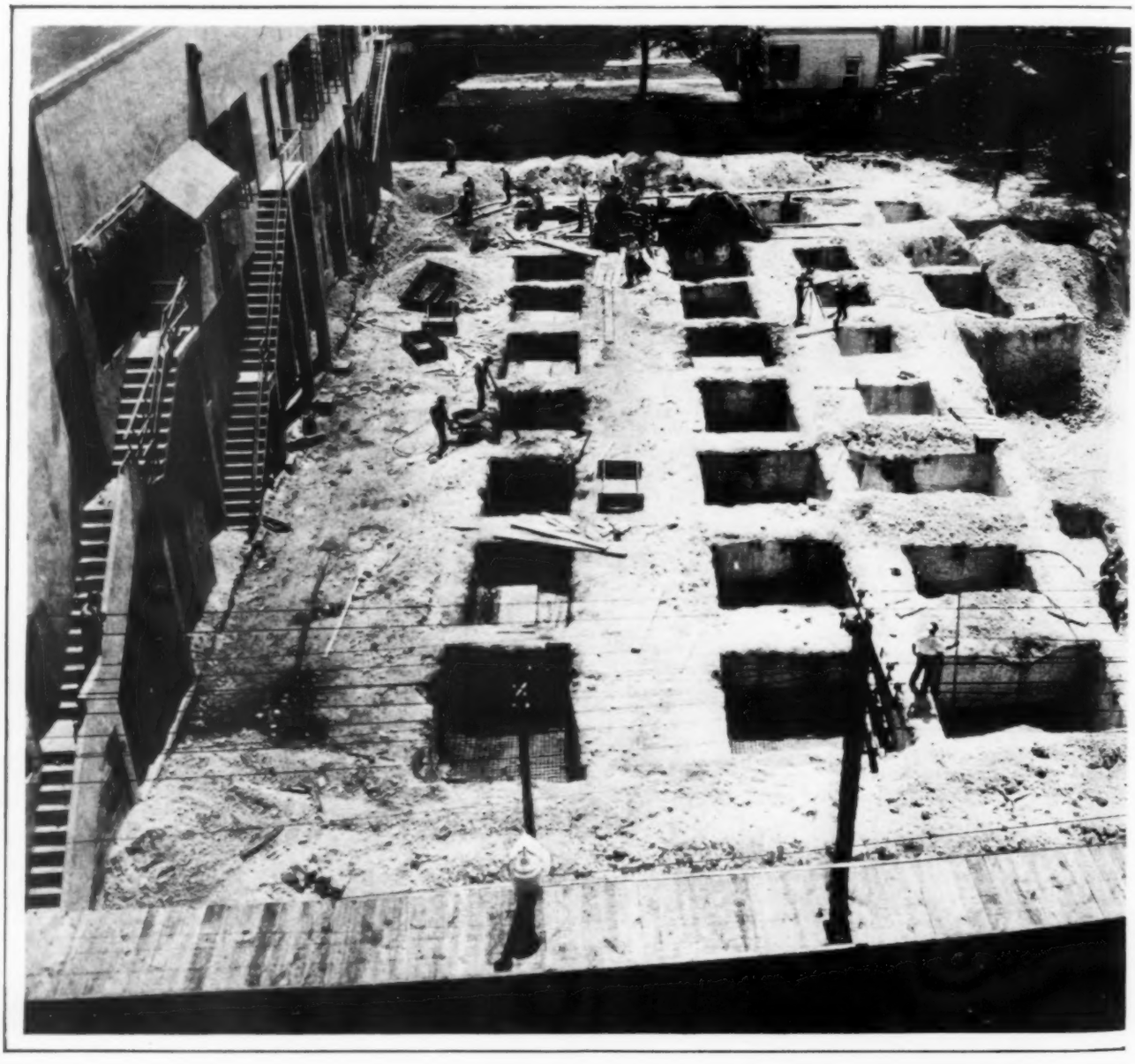
Excavation for Big Building Cut in Coral Rock Without the Use of Explosives

THE excavation shown at the bottom of this and the opposite pages, which looks somewhat like a partly eaten waffle, was dug for the foundation of the new Florida East Coast Railway Building at Miami. The actual digging was done by a Barber-Greene ditcher which solved the problem of cutting through the coral rock which underlies Miami, without the use of dynamite.

The pits shown in the photographs vary in size. Some of them are 6 ft. by 6 ft., others 8 ft. by 8 ft. and others 8 ft. by 10 ft. At the time the photographs were taken, the ditcher was engaged in cutting pits for the boiler room. These boiler room pits extend about 12 ft. below the ground level. The 3-in. planks which support the ditcher while finishing the cut, may be seen just back of the machine. One crawler travels on the planks, while the other is supported by the side of the pit. The material cut out by the ditcher is shoveled away in back of the machine and is then carried off by trucks.

A close inspection of the photograph on this page will show some of the reinforcing steel in place in the bottom of the pits ready for the pouring of the concrete. The concrete mixer is shown in the background.

Various other types of equipment were considered for this work before the ditcher was put on the job, but in every other case it was found that some blasting would be necessary. The ditcher entirely eliminated the blasting and in addition, cut the pits in a much more smooth and even manner than would have been possible with other equipment.



The ditcher used on this job was owned and operated by John Rollins of Miami. The new building, when completed, will be 12 stories in height, 170 ft. long and 150 ft. wide.

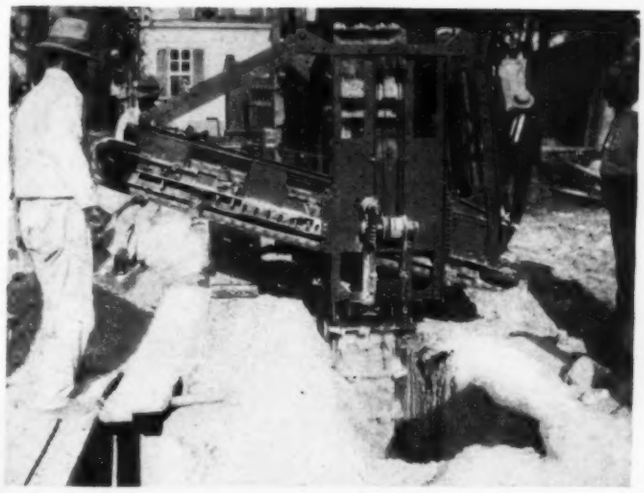
The success of the ditcher in handling this sort of work has resulted in its use for similar jobs in Florida. The Barber-Greene ditcher owned by the J. L. Kelley Construction Company, has been digging similar pits for the new Miami Athletic Club building. Other ditchers have been excavating for septic tanks, post holes and other such work, in each case making it unnecessary to blast the coral rock.

Eliminating the use of dynamite in digging foundation pits of this character does away with the shattering effects of the blasting and leaves an intact wall that provides a solid supporting material.

Small Ditcher Cuts Through Coral Rock

The large photographs show the work which the ditcher accomplished in excavating for a 12-story building

The small photograph at the right shows the ditcher beginning a cut



Will You be Next on

YOU have seen the picture which won the August prize. Photographs were received from every section of the country and it was no easy job to pick the winner. Entries for the September contest are already coming in. Send yours along.

Successful Methods will pay $25.00 each month until further notice for the photograph most suitable to its needs taken by a man actually employed on the job shown in the photograph. Photographs should be accompanied by a brief description of the job, giving location, name of contractor, name of owner, size of job, when begun, when finished, etc. And don't forget your own name, your address and the nature of your work.

The Editor of *Successful Methods* will act as judge and will determine which photograph is best suited to the needs of this magazine.

All photographs should be sent to *Successful Methods,* McGraw-Hill Publishing Company, Tenth Avenue at 36th Street, New York City, and plainly marked "Photographic Contest."

Our Picture Payroll?

ANY picture that is to be considered in awarding the $25.00 prize for the September issue of *Successful Methods* must be in this office not later than Tuesday, August 10th. All contest photographs, other than the prize winning photograph, which are used in *Successful Methods,* will be paid for at the rate of $1.00 each. Please don't send photographs of jobs that are now ancient history.

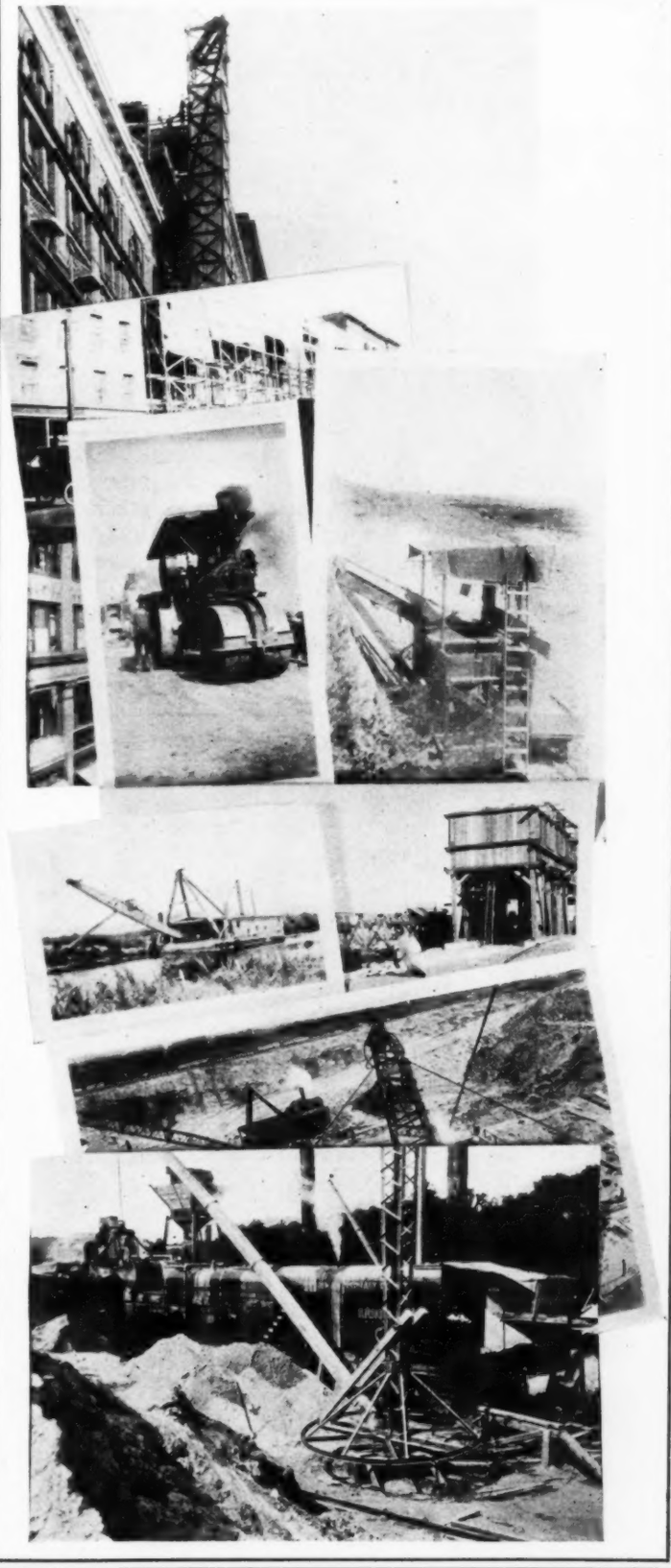
Get out your camera and go after the

$25

prize

REMEMBER you must be employed on the job shown. No photographs from commercial photographers will be accepted. A resident engineer or inspector on a job will be considered as employed on that job. The contractor, superintendent, foremen and men all down the line are eligible.

Successful Methods



Building a Convent School

Thoroughness More Important Than Speed on Detroit Job

A BUILDING program which provides for two years of continuous construction has been undertaken by the Marysgrove Home for the Nuns, a girls' seminary at Detroit, Mich. Several buildings are now under construction by the W. E. Wood Company of Detroit which began work in April of last year. It is expected that the entire group of buildings now under construction will be completed by July 1, 1927.

The two largest units in the group are the Liberal Arts and Educational Building and the Residence Hall. The former is about finished and is shown in the upper photograph on this page. The lower photograph on this page shows the Residence Hall which also is now under construction.

The Liberal Arts Building is 372 ft. in length by 68 ft. in width with three connecting wings 100 ft. by

The masons at work on one of the wings of the Residence Hall

50 ft. each. The average height of the building is 68 ft. and the cupola in the center will be 135 ft. high. The Residence Hall is about the same size. The construction of a power house which is being built of brick has been started recently.

The excavation for the seminary buildings was a difficult job as sand with water close to the surface was encountered. The water came in when a depth of 6 ft. had been reached and the excavation had to be drained as there were pits of clay at a depth of 17 ft. which held the water.

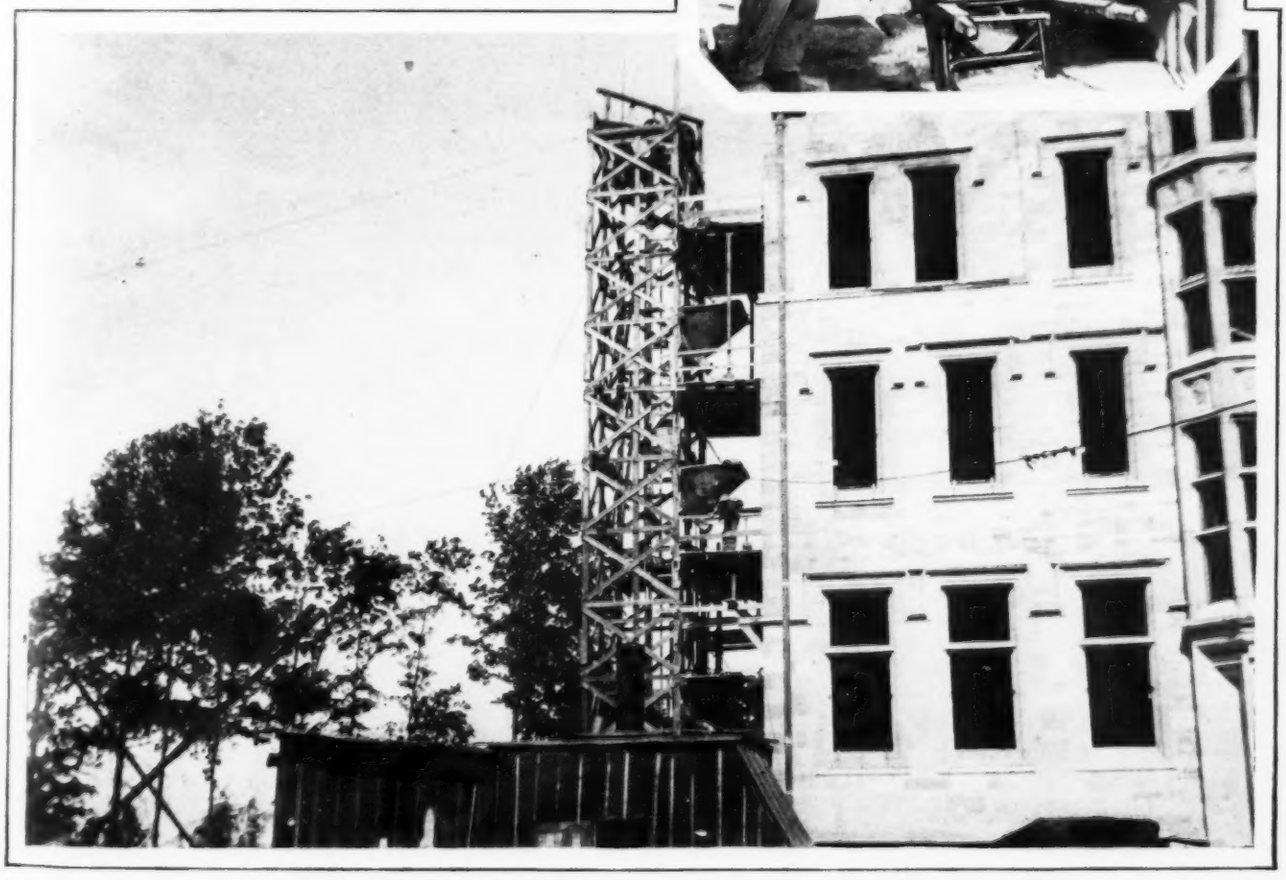
The photographs on this page show the methods used by the contractors for hoisting concrete on the Residence Hall job. Large hoppers are built at each floor into which the concrete is dumped from the elevator bucket. It is then conveyed from these hoppers in wheelbarrows and concrete carts to the points at which it is used.

The Liberal Arts Building and the Residence Hall both are faced with Bedford, Indiana, limestone. Much of the stone is cut on the job. The Liberal Arts and Educational Building will contain a chapel in the center of the building underneath the cupola shown in the photograph. The library also will be located in the center of the building and the wings will be used for class and lecture rooms, study halls and offices. All of the living quarters, both for the nuns and for the students, will be in the Residence Hall.

The job is one of the biggest of its kind now under way in the Middle West and is a typical example of institutional construction. The speed that is necessary in putting up such structures as office buildings and hotels is not required on such a job and the W. E. Wood Company is keeping to a schedule which makes it possible to give each operation the maximum of care and supervision. Great attention is being paid to details and thoroughness rather than speed is insisted upon in every phase of the work.

There are jobs of this sort to be had in nearly every section of the United States and they give the contractor an opportunity to plan his work in such a way that he can tell just where he will stand over a considerable period. He can establish his construction plant in one spot and keep it there for a couple of years, thus eliminating the frequent moves which are one of the most expensive items of the construction business. The number of men employed also can be kept fairly constant and an efficient organization built up.

A large hopper at each floor receives the concrete from the hoist bucket. Wheelbarrows and concrete carts are filled from these hoppers as shown in the photograph at the right



Derrick Makes Quick Exit

Crane Dismantles and Loads Outfit Including Heavy Engine in Eight Hours

DISMANTLING a derrick on a construction job often becomes a time consuming affair. The Foundation Company of New York had been using a 60-ft. stiff-leg derrick on some excavation work on Academy Street in Newark, N. J., recently and when the time came to dismantle it, decided to try out a new method. One of the five Universal cranes owned by the Crane Service Company was hired by the Foundation Company for the work.

The crane arrived on the job at 7:45 o'clock in the morning and at once was backed out on a platform which had been built previously in order to keep the mixer and stock piles out of the street. The work of removing the derrick then began, various units being loaded in motor trucks with trailers which were able to stand in the streets and still leave room for one line of traffic. One end of the truck loaded with the 60-ft. boom may be seen in the large photograph.

The derrick outfit including the engine was completely dismantled and loaded on the trucks in 8 hours. At 4:30 o'clock in the afternoon, the crane left the job and was sent immediately to a coal yard 2 miles away where it was employed with two other cranes in the work of handling coal.

By using platform built to keep storage pile off street, crane removed derrick without blocking traffic.

Delaware River Bridge

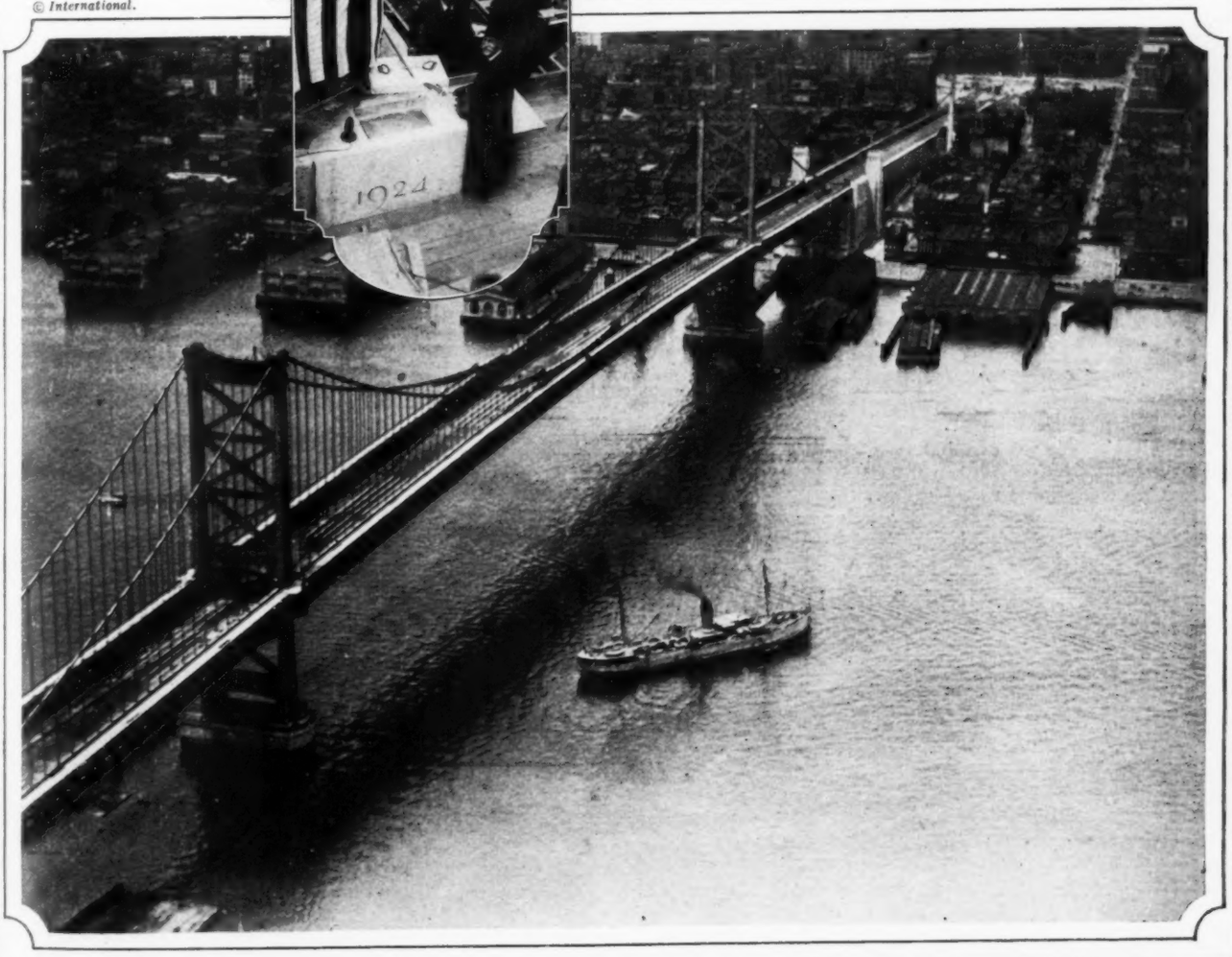
Philadelphia

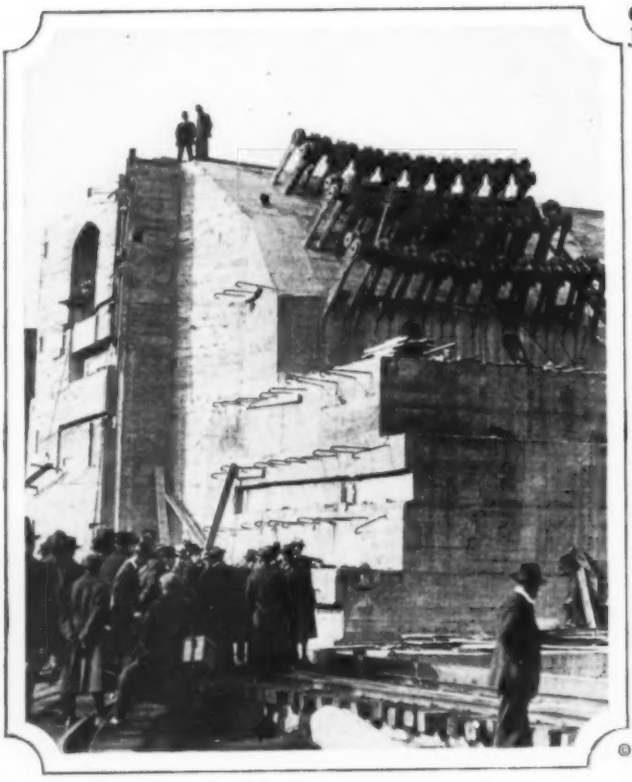
Opened July First 1926

Camden

© International.

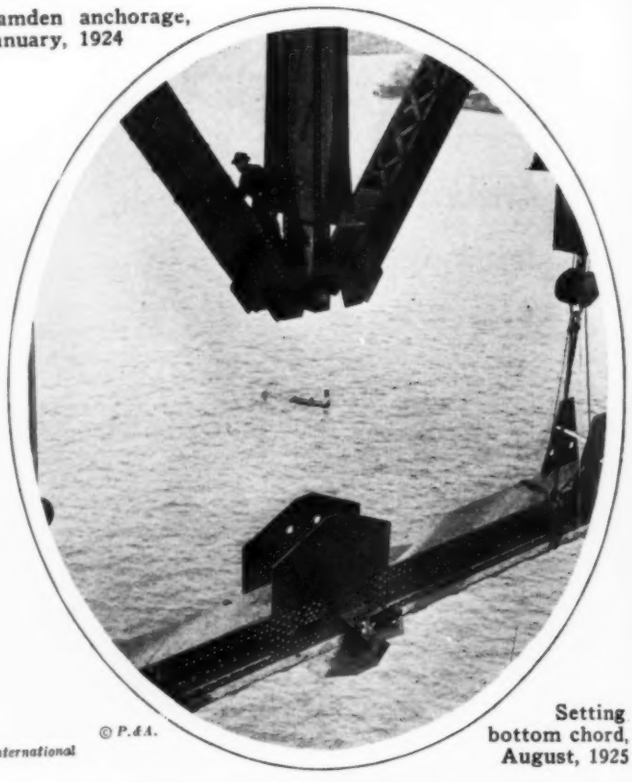
© P. & A.





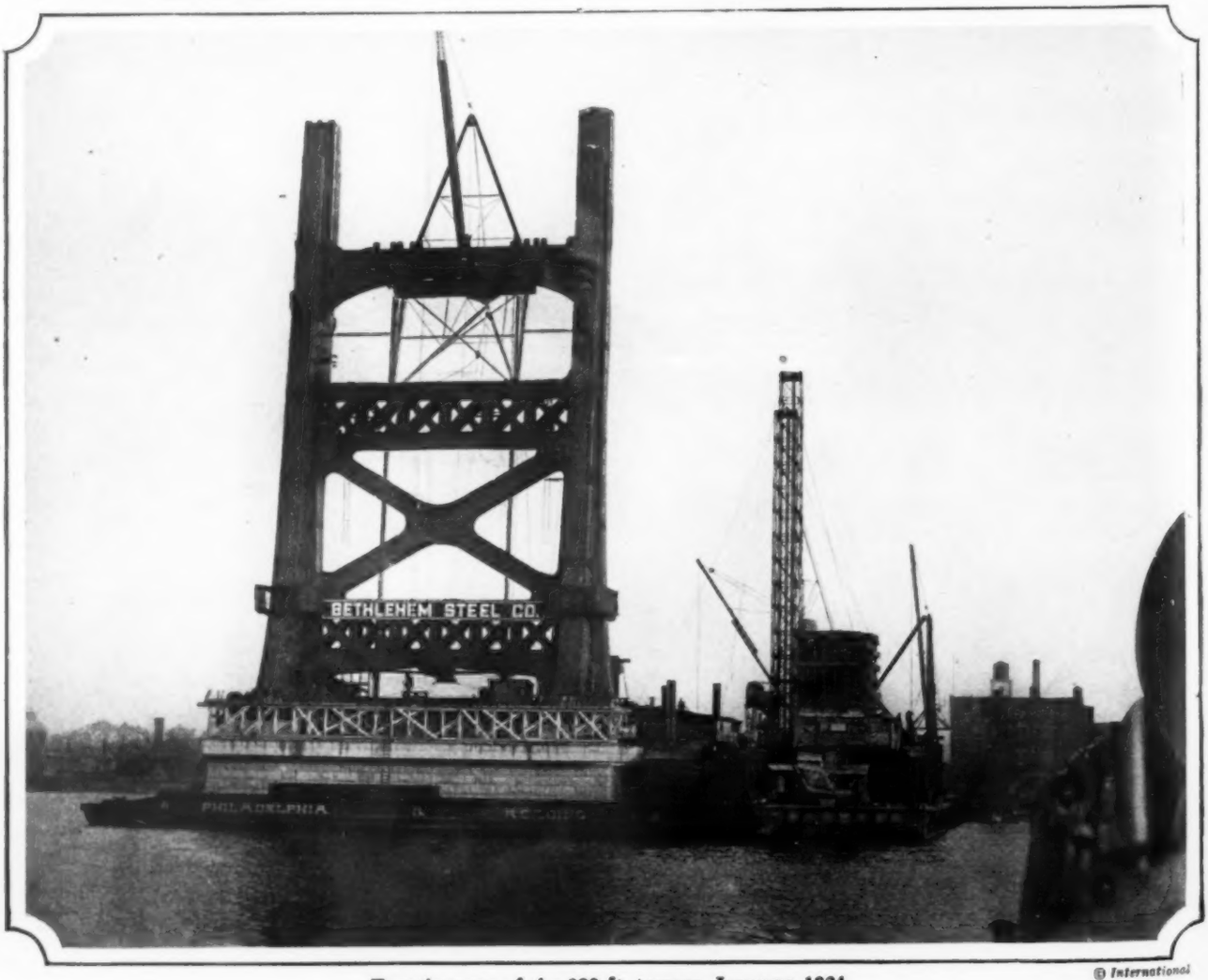
Camden anchorage, January, 1924

© International



© P.&A.

Setting bottom chord, August, 1925



Erecting one of the 380-ft. towers, January, 1924

© International

Paving the Philadelphia approach. June, 1926

Compressing one of the great cables containing 18,666 separate wire strands

The towers of the bridge showing sidewalks used for stringing cables. August, 1924

© International

GOV. MOORE, NEW JERSEY

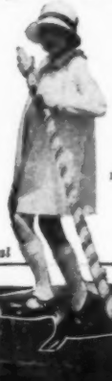
MAYOR KING, CAMDEN

CHIEF ENGINEER MODJESKI

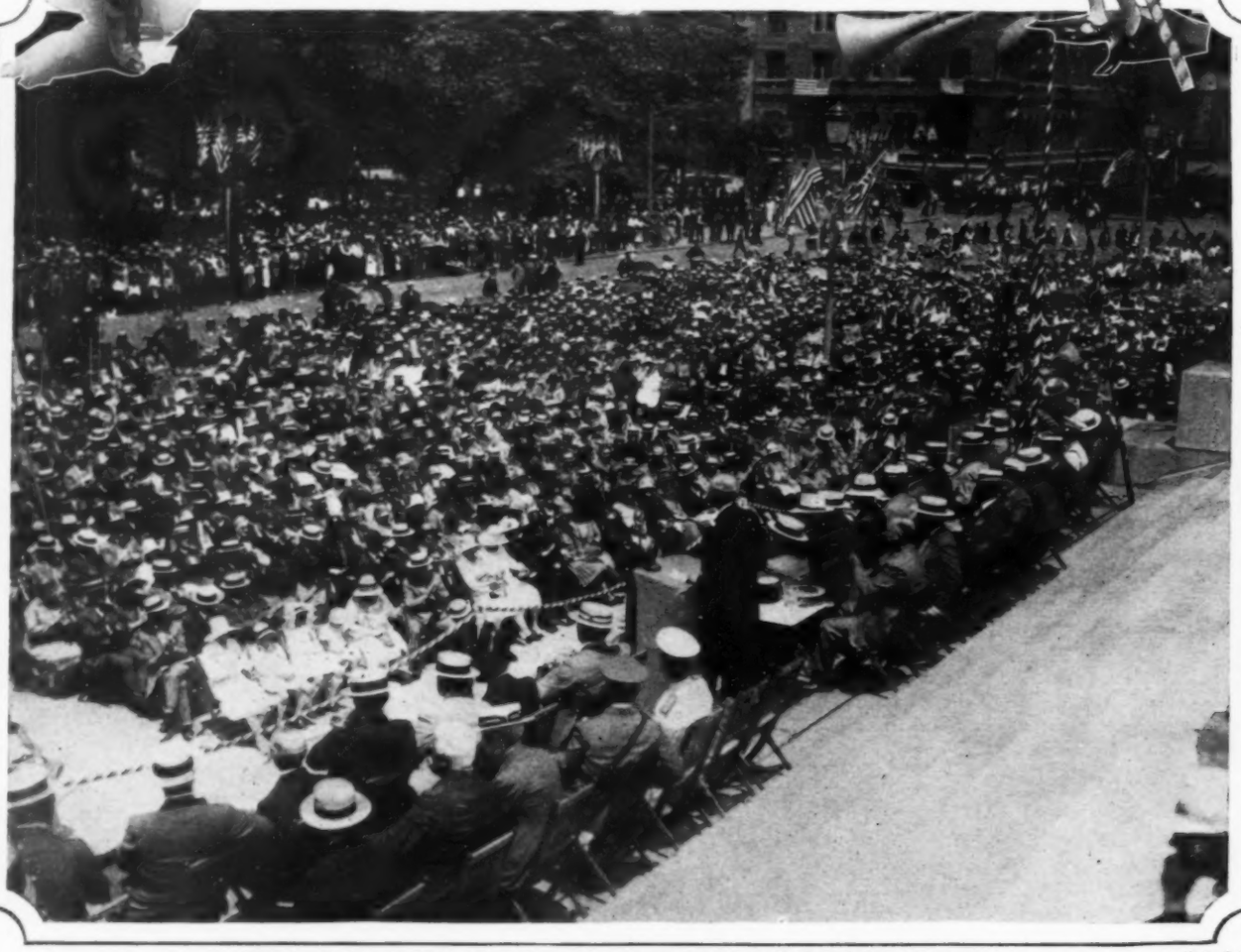
© International

GOV. PINCHOT, PENNSYLVANIA

MAYOR KENDRICK, PHILADELPHIA



ESTINE LEWIS OPENING BRIDGE



GOVERNOR PINCHOT ADDRESSING THE CROWD ON THE PHILADELPHIA PLAZA AT THE OFFICIAL OPENING

© P. & A.

Ripping Up Old Street Car Tracks

English Town Adopts Trackless Trolley System and Has To Relay Road Surface

By G. Crowther

A COMBINATION of circumstances in England has made it uneconomical to relay street car tracks in many places and in a large number of cities and towns trolley cars are giving place to motor-buses and electric railless vehicles.

The town of Keighley, in Yorkshire, was one of the first to decide to replace its street car service and put in its place electric trolley vehicles which run on rubber tires, and the work of reconstructing the roads has just been completed. Six miles of track have been taken up, and this has necessitated the relaying of the road surface over the whole of the distance.

Without previous experience in the tearing up of track on a wholesale scale several experiments were made. It was found that the most expeditious manner, and also the most economical was to remove the road surface at each side of the rails and between the tracks, cut away the fish plates and the holding down bolts and then lift the rail by means of jacks under one end of the rail.

Oxy-acetylene was used for cutting, on account of the ease of the removal of the cutting apparatus, and the flame was also used to cut the rails into short sections for convenience of handling. The road surface at the side of the rails was cut by pneumatic chisels driven from Ingersoll-Rand portable compressors.

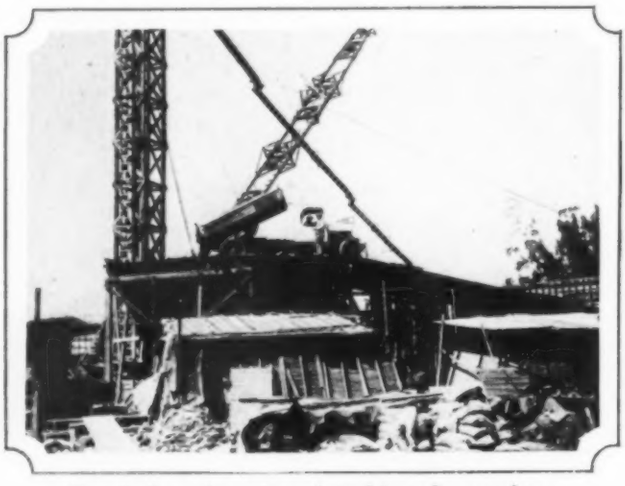
For the renewal of the road surface various processes were used as it was considered cheapest to use over again a considerable quantity of granite setts which were found to be in good order when taken up.

At left — Cutting rails with oxy-acetylene torch. Below—Compressed air used for pavement breaking

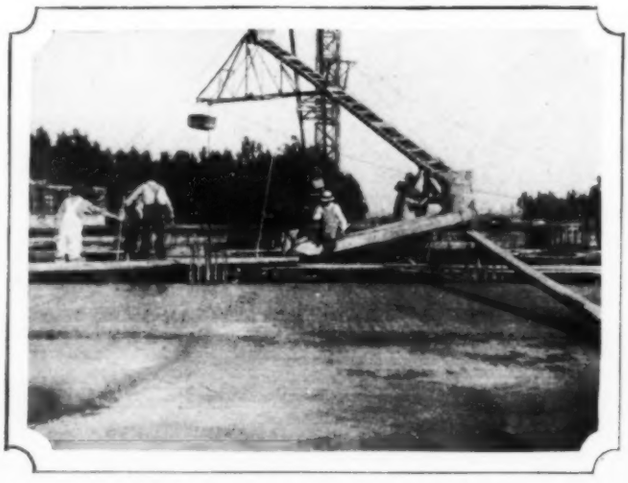
One Concrete Plant for Three Buildings

Long Boom Enables Contractor to Keep Bins, Mixer and Tower Stationary

A NEW high school consisting of six reinforced-concrete buildings costing about $600,000 was completed recently in Long Beach, California, by J. D. Sherer & Son. The photograps which accompany this article were taken by Horace C. Sherer, Jr., junior member of the firm of J. D. Sherer & Son. They were entered in the *Successful Methods'* photographic contest and although they did not receive the prize, were so interesting that it was decided to reproduce them here



Truck dumping stone into bins above mixer



Chuting concrete direct to floor slab

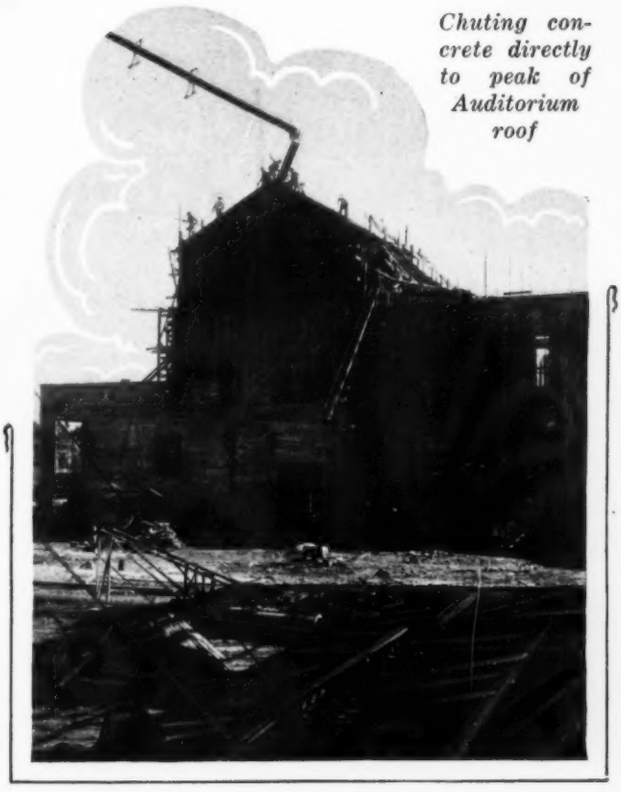
A general view of the job showing all three buildings

for the benefit of the readers of *Successful Methods*.

The three main buildings, the Science and Administration buildings and the auditorium were laid out so that they made four sides of a figure somewhat similar to a pentagon. These three buildings contained 7,500 yd. of concrete. A wood tower 150 ft. high was built at a point about equidistant from all three buildings, and a wood boom 180 ft. long was then built to carry 200 ft.

The concrete plant in operation

of chute. This boom is shown plainly in several of the photographs. It was reinforced with bolts and steel angles and trussed with cables. It was so arranged on the tower that it would cover about 200 degrees. When it was necessary to move it so as to pour concrete on another building one set of guys had to be removed which took only about 40 minutes.



Chuting concrete directly to peak of Auditorium roof

A central mixing plant was built in back of the tower and the mixer was placed under bins which held the stone and sand. These aggregates were brought to the bins by motor trucks which climbed an inclined plane to a point above the bins. The mixer itself was set about 7 ft. below the ground level and discharged directly into the tower bucket.

The bins and mixer were so arranged that one man could control both. With his left hand he governed the amount of aggregates flowing from the bins into the mixer and with his right hand he ran the mixer.

The new school is known as the Woodrow Wilson School and provides accommodations for a large number of students. The entire job was finished in about nine months.

Miami University Gets on Front Cover

First Buildings of Great New Educational Institution Now Under Construction in Florida

THE photograph which appears on the cover of this issue of *Successful Methods* shows work under way on the new buildings of the University of Miami, in Miami, Florida. Some time ago, G. E. Merrick gave a site of 160 acres and subscribed $5,000,000 for Miami University as an initial endowment.

The plans for the university call for the erection of about twenty buildings and it is estimated that they will cost approximately $15,000,000. The cover photograph was taken very recently and shows the excellent progress that is being made. The Coral Gables Construction & Supply Co. has the contract for the work. The architects are P. E. Paist and Denman Fink.

The photograph was selected for use on the cover because it is typical of the work that is now going on in Florida and which is attracting the attention and interest of men engaged in construction in every part of the United States.

Every now and then some reader of *Successful Methods* sends in a photograph which is used on the front cover. Such photographs are more than welcome and of course will be paid for when so used. Any reader of this issue who has a photograph of some up-to-date work that he thinks possesses the qualities necessary for a good cover is urged to send it in. All such photographs will receive careful consideration.

Bear Cat Owners Tell What Features of the Machine Appeal to Them Most

WE ASKED several hundred Bear Cat owners to state what they liked most about the machine. Their answers furnish more good sales points than we ever thought of ourselves. Here are just a few of them:

"Speed and economy in operation."—J. C. Atkinson, Garaux Bros. Co., Canton, Ohio.

"Its ability to dig basements without putting the machine into the hole."—J. R. Wing, Elgin, Illinois.

"The fact that the body does not swing with the boom, making it convenient in close quarters."—E. A. Prentis, Jr., Spencer, White & Prentis, New York.

"Its sturdy build. Have had no cost for repairs."—Joseph Bernardi, Sault Ste. Marie, Mich.

"It is quick, can be operated by one man, and can get in places where other machines cannot."—C. B. Huffman, Kendallville, Ind.

"Its width between crawlers. Medium weight."—C. M. Brown, Tulsa, Okla.

"Easy to load and unload, and the cost of operation is very low."—John Phillips, La Plume, Pa.

"Portability, ease of operation, adaptability."—J. M. Wardle, Chief Engineer, Canadian National Parks, Ottawa, Ont.

"First, the engine, as yet trouble proof. Second, size. Can be used in narrow places."—Harold F. Wilson, Wilson Construction Co., Mason City, Iowa.

"Power plant, simplicity of drum arrangement, and the lever control action. Easy to operate."—F. S. Puccio, Oneonta, New York.

"The speed with which the different attachments may be adjusted. Also the one big feature, it is a 'one-man machine.'"—Wm. H. Hansen, Sioux City, Iowa.

"Engine, and caterpillar traction."—Edwin Heitbrink, Illinois Brick Co., Chicago.

"Low first cost, ease of operation, speed of swing, simple construction."—S. C. Sommer, Sommer Baer Drainage Co., Ogden, Utah.

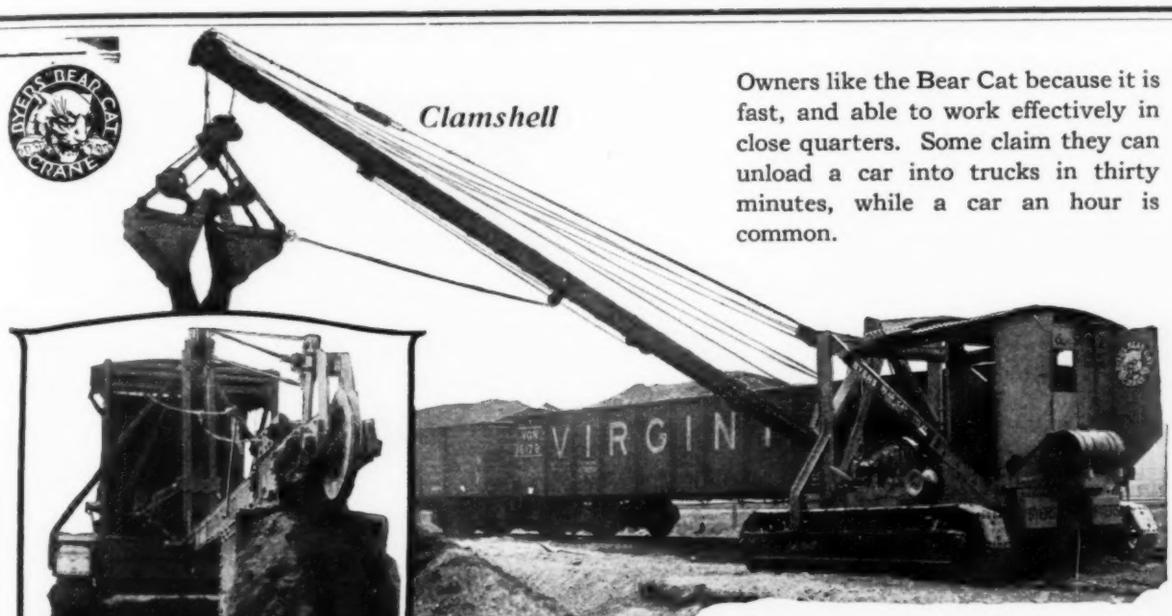
"The fact that you can use the machine in so many ways."—Olivarri Contracting Co., Santa Ana, Calif.

"Sturdiness and mobility."—H. A. Jones, Hodgson & Jones, Montgomery, Ala.

"One man operation, compactness, full caterpillars."—Joseph H. Johnson, Elmhurst, N. Y.

"Absence of breakdowns and small amount of repairs necessary to keep the machine operating."—R. E. Dewyn, W. J. Irwin & Sons, Williamsville, N. Y.

Would you like to read the rest of what these owners said? Their complete answers and many others are contained in our new booklet entitled, "Ask Bear Cat Owners." Send for it. The Byers Machine Company, Ravenna, Ohio.



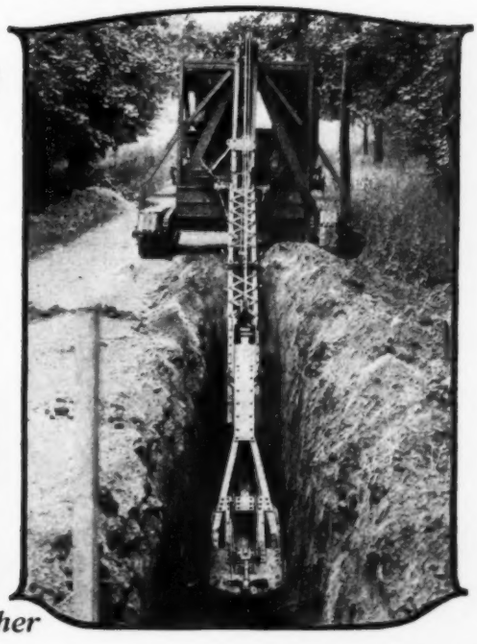
Clamshell

Owners like the Bear Cat because it is fast, and able to work effectively in close quarters. Some claim they can unload a car into trucks in thirty minutes, while a car an hour is common.

Skimmer

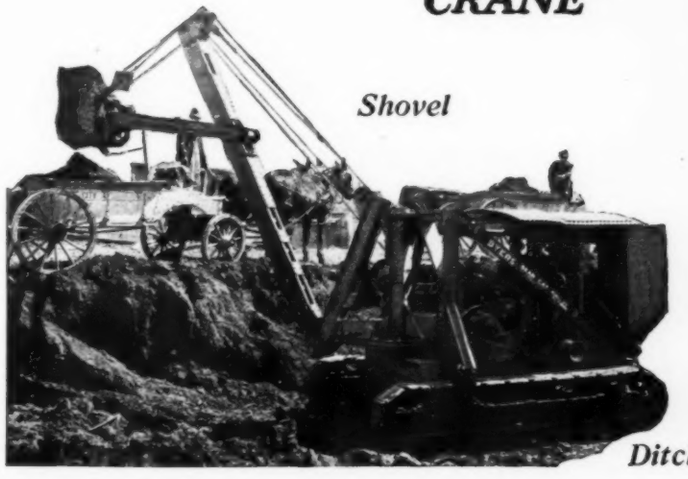
Note the straight-ahead action of the Skimmer in the picture at the left. A full bucket on shallow grading, and a smooth even grade. The Ditcher and Shovel are shown below.

The ALL-PURPOSE ONE MAN CRANE



Ditcher

Shovel



WHEN you get a Bear Cat Crane you have a tool for almost every kind of a job that you can think of. It handles all the interchangeable attachments shown, besides a backfiller which we believe to be the most effective for such work on the market. It also handles special attachments such as pile driver, skip, tip-over bucket, etc.

One man operation and low fuel and repair costs make the Bear Cat surprisingly economical considering the work it will do. Full caterpillar mounting provides 100 per cent traction and stability, with quick moving up and turning.

There's no other machine like the Bear Cat. That's why its sales have kept on growing so tremendously.

THE BYERS MACHINE COMPANY, *Ravenna, Ohio*

Builders also of Byers Truckrane. Sales and Service Throughout the Country.

THE BYERS MACHINE CO., Ravenna, Ohio

Gentlemen:— Please send me the new Bear Cat Booklet "Ask Bear Cat Owners."

Name .....

Address .....

Town .....

State .....

SM 8-26

BYERS BEAR CAT

Widening a Railway Bridge

Matching Old Stone Piers and Working in Cold Weather Add to Difficulties of Job

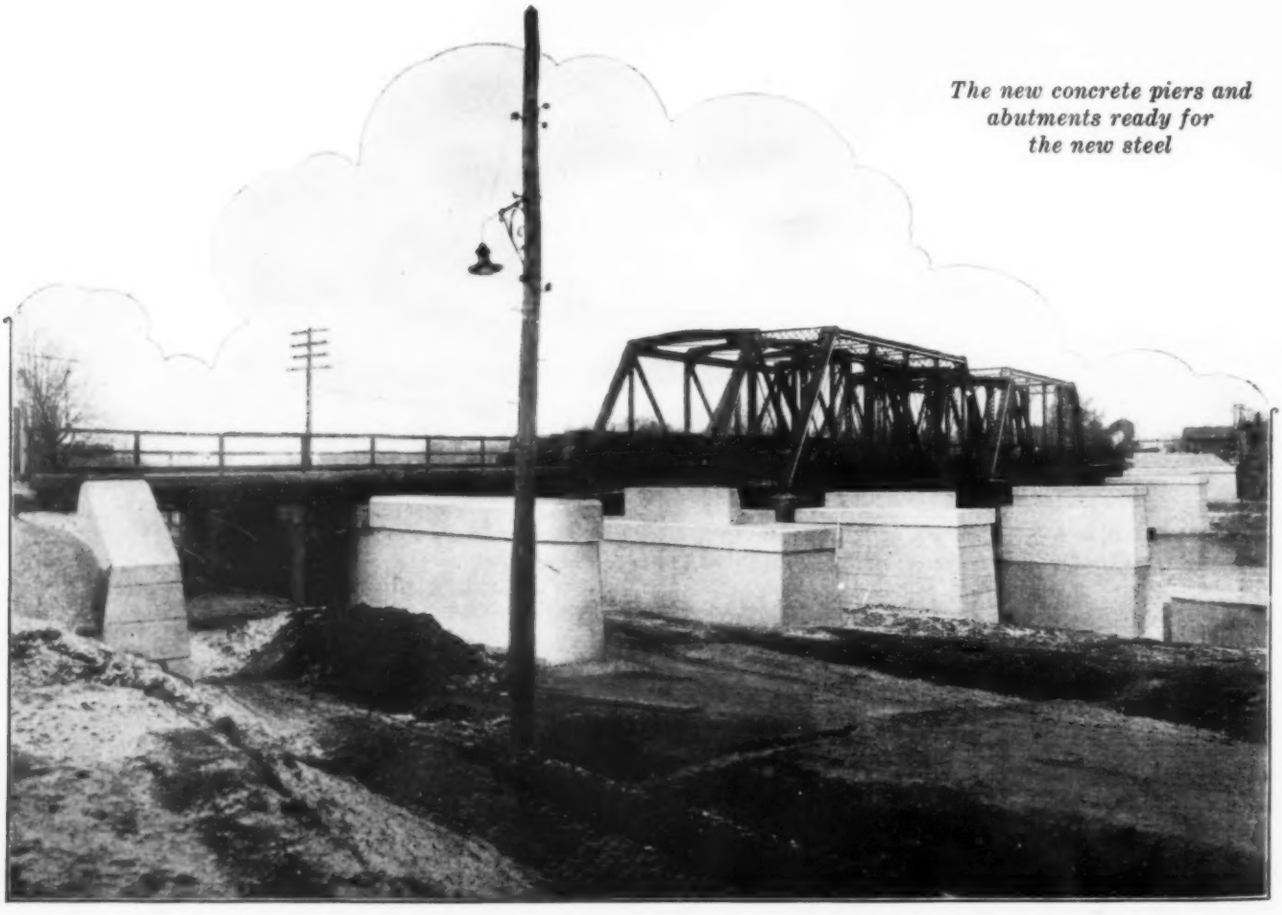
ADDING to an existing structure in such a way that the old and the new are in harmony with each other always presents a difficult problem and the difficulty is increased when it is decided to build the new structure of different material from the old. The Grant-Boulton Company, contractors of Columbus, Ohio, undertook such a job recently for the Pennsylvania Railroad.

A bridge across the Sandusky River at Tiffin, Ohio, was to be widened and the Grant-Boulton Company obtained the contract for constructing the new abutments and piers. The old piers and abutments were of stone construction while the specifications for the new called for concrete. Similarity of appearance was deemed so important that the design required the scoring of the new concrete work to conform with the courses of stone in the old piers. To complicate the problem, most of the work was carried on during the winter months and under extremely unfavorable conditions. Traffic, of course, was maintained over the bridge during reconstruction. Some of the details of the methods used are described herewith, and the photographs on the opposite page show the work in progress.

The footing excavation for the piers at either edge of the river was accomplished with the aid of sand bag cofferdams extending from the old piers, outside the neat line of footers and thence back to the shore. After sealing the dam with fine cinders, the water was pumped out without difficulty. The foundations were carried into solid rock to approximately 1 ft. 6 in. and further anchored by dowels made from 1¼-in. reinforcing bars.

The new pier in the middle of the river was handled in an entirely different manner, inasmuch as it was completely surrounded by water in varying depths up to 6 ft. By the time the work was started at this point, the river had frozen over solid. The form was framed on top of the ice for a concrete cofferdam around the entire new pier, and when this was done the ice, which was then about 8 in. thick, was cut and the form lowered into place and driven down to rock. The form was then filled with concrete by means of tremie, with lime added for waterproofing purposes.

At intervals of 10 ft., inverted U-bolts made of 1½-in. round steel were placed in the concrete so that after the pier had been completed, the concrete cofferdam could be removed. This was accomplished by drilling one hole the full depth of the concrete wall, midway between the U-bolts and lifting each section out with a



The new concrete piers and abutments ready for the new steel

At left—Looking down into the concrete cofferdam from the top of the old pier. Some of the forms in place and ready for the concrete

At right—Part of the concrete cofferdam showing the old stone pier at the right and the U-bolts sunk into the concrete and used for removing the cofferdam

locomotive crane after fracturing with one-half stick of dynamite to each hole, all being detonated at once.

The concrete for this work was poured in lifts, ranging from 6 to 8 ft., each day's pour ending at an elevation where a scoring strip was located.

Concrete was poured when the temperature ranged from freezing to 10 degrees below zero, the mixture being protected in the following manner: Water for the concrete was heated to a temperature of 70 to 150 degrees, according to the severity of the weather by running it through a heater made of 3-in. wrought iron pipe, under which a coke fire was kept burning. For heating the aggregate, two flat cars were obtained and sided up to give them the desired capacity. On the floors of the cars there was placed a steam grillage made of 1¼-in. pipe, laid on 12-in. centers and the lines on the cars connected by detachable steam hose. At the close of each day's pour the cars were again loaded with stone and sand and the entire aggregate covered with tarpaulins and the steam lines connected during the night to boiler of the locomotive crane. In this manner the stone and sand were heated to any desired temperature by morning and then hauled to the bridge site for mixing and placing, from a mixer mounted directly on the cars.

To prevent freezing after pouring, two steam lines 1¼ in. in diameter were laid around the base of each of the piers, with the entire form covered with 16-oz. tarpaulins. Thereafter, the steam, which was piped from a boiler at one side of the river, was kept constantly on the concrete from 48 to 96 hours, according to the temperature. So efficient was this method of protection that no concrete was lost, although the mercury reached as low as 18 degrees below zero during the process of curing.

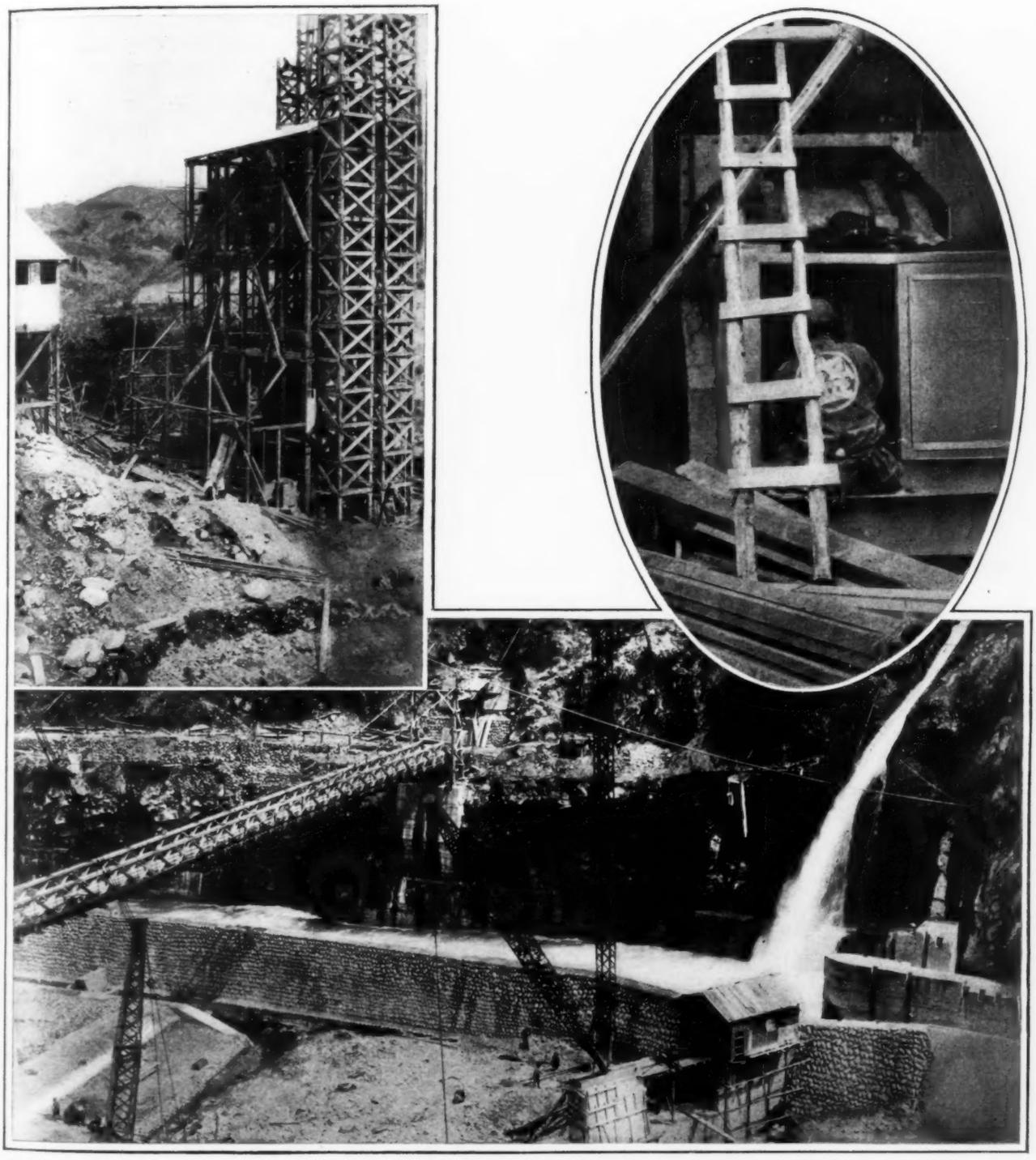
Another fact of interest was that on the exposed surface of approximately 8,000 sq.ft. there was not a single patch, so thoroughly did the men in the forms do their work.

This work was done under the direct supervision of R. W. E. Bowler, Division Engineer of the Toledo Division of the Pennsylvania, and his assistants.

Smoothing the President's Path

Working on one of the roads leading to Osgood Lake so that it would be in good shape when President Coolidge arrived

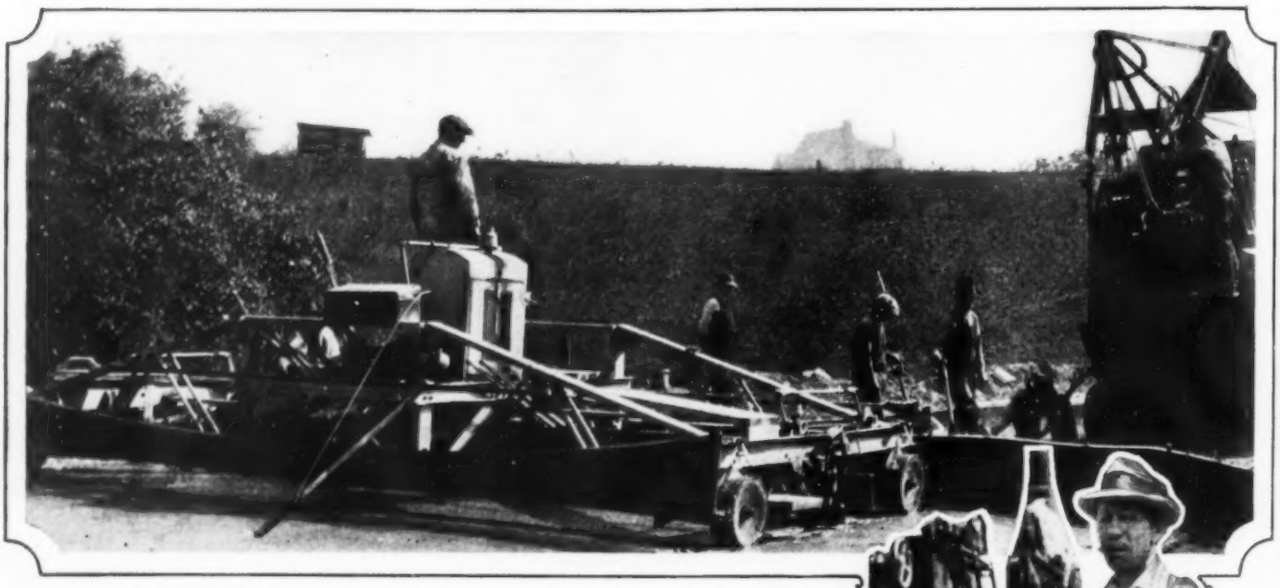
American Mixers Build Japanese Dam



MACHINERY made in the United States is being used in the construction of a dam across the Shogawa in Japan. The photographs on this page give a good idea of the magnitude of the work. The lower photograph shows the foundations of the dam including some of the temporary structures built to confine the course of the stream while the work is going on. The upper left-hand picture shows the concrete chuting tower at the base of which four Koehring 28-S mixers are at work. The photograph at the right gives a glimpse of one of the mixers under the tower operated by a Japanese workman. The dam is about 250 ft. in height from rock to the roadway on the crest and is something less than 1,000 ft. in length. It will impound the waters of the Sho River at a point about 30 miles from the mouth. It is part of a hydro-electric development of the Nippon Electric Co. and is to provide water for a turbine-generator station which will send power to either Tokyo or Osaka. The project is located about midway between these two cities and could sell power to both except for the fact that they use different frequencies.

Finisher Meets Unusual Demands

Long Series of Widened Curves on Stiff Grade Provide Machine With Tough Assignment



Finisher equipped with special 24-ft. screed

Andrew McPherson on the job

FINISHING a slag concrete road consisting of about a mile of widened and super-elevated curves on a 10 per cent grade and only half a mile of straight going was the unusually difficult task recently completed in Allegheny County, Pa. The contract for paving the Baldwin road near Thornburg put this hard problem up to McPherson Brothers of Edgeworth, Pa., who handled the work. In the total length of about 8,600 ft., there were only 3,600 ft. of tangent. There were sixteen curves, all but three of which had to be widened. The grade was 9.5 per cent at one end and 10 per cent at the other with lesser grades in only one

False forms at widened curves

or two places. The job also included 75,000 yd. of excavation.

An 18-ft. Lakewood screed was selected to do the finishing. In order to use the screed on the widened portions of the road as well as on the 18-ft. sections a 24-ft. strike-off was attached to the machine. The investment in the longer screed proved a great economy because of the large amount of widened surface which had to be finished.

The light, coarse aggregate, in combination with a one inch slump, made smooth finishing by mechanical means an apparently impossible proposition. The Lakewood finisher, however, did such good work that the job became famous for miles around and groups of contractors would sometimes appear to watch the machine in operation. The special screed effectively produced a smooth, dense surface, and no difficulty was experienced in working up mortar for the finish.

The center line splitter in action

Lapped wooden false forms were used to carry the 18-ft. machine around the widened parts of the road. These forms were torn up as soon as the screed had passed, and the disturbed section was filled and finished by hand.

The finisher at work on a curve

An ingenious device for making the center line joint was designed by Andrew McPherson, in charge of the work. It consists of a steel strip, one end of which is attached to a bar at the rear of the screed, while the other end travels along the center plate and cuts the joint through the soft concrete. Two blades at the lower end run on the two sides of the center plate and act as flanges to keep the "center line splitter" in position. The splitter not only gives a firm, straight center line joint but also does away with the labor of one man.

The improved type of hand float, shown on page 34, gave pleasing results on the job. The mortar can work up between the strips and thus be more effectively spread to produce a smooth surface. The old single board float had a tendency to leave a wavy surface.

Pouring concrete on reverse curve of Baldwin Road

This triple strip float worked up the mortar with ease

Finishing the surface after false forms have been torn out

Dumping cement into a truck from the miniature tipple at the end of the elevated railway

The triple strip arrangement pretty well overcomes this defect by partly removing the cause.

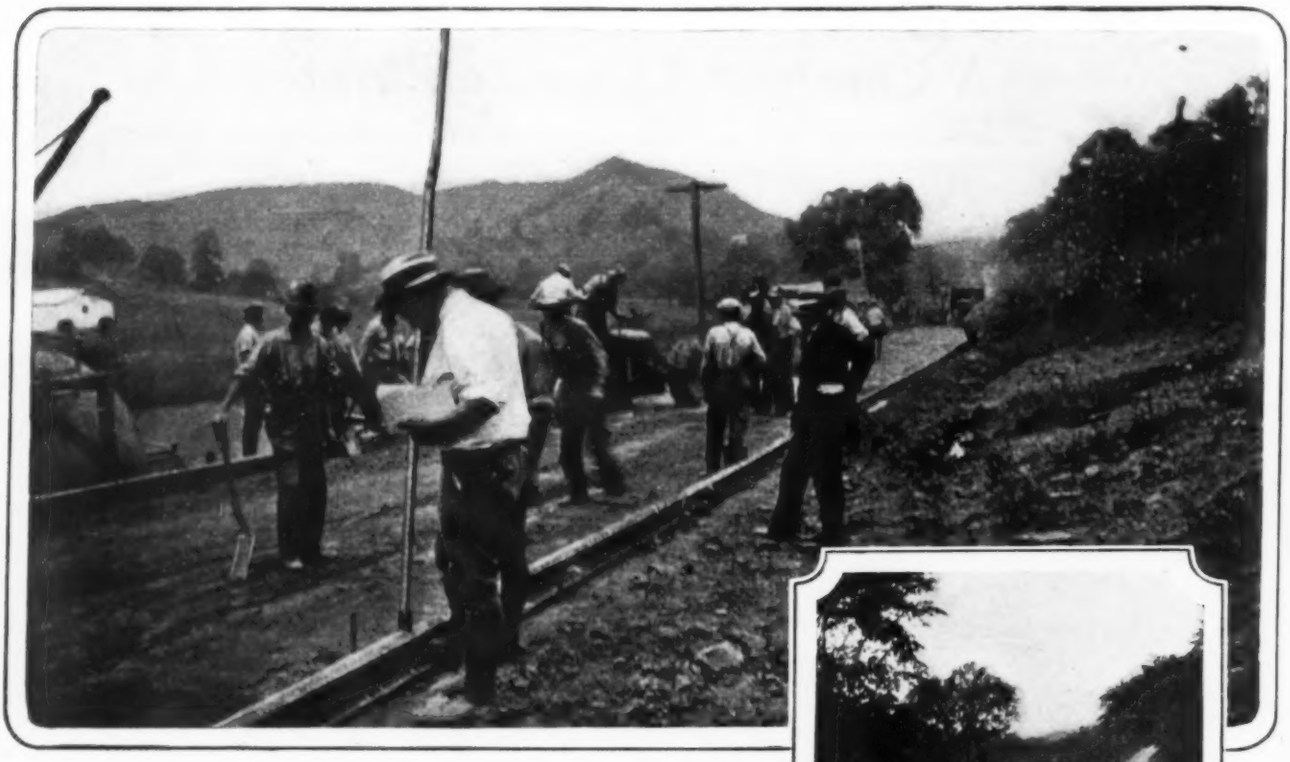
Mr. McPherson had a couple of former coal miners on the job and gave them the task of handling the cement. They looked over the land and then built an elevated railway for hand trucks. This railway extended from the freight car, through the storage house, and to the end of a platform where the sacks were dumped into trucks. A portable section of track was laid on the floor of the car being unloaded. The arrangement reduced the labor of handling the cement to a minimum. Mr. McPherson is firmly convinced of the economy of elevating the cement at the unloading point in order to make every process of handling from there to the mixer an operation of dumping rather than lifting.

The road, which has just been opened, was built as part of Allegheny County's plan to encircle Pittsburgh with "ring" roads. The County Department of Public Works has in the last few years spent its appropriation in constructing radial roads leading from the city in the directions drawing heaviest travel. The radial system has been developed to a high state of perfection, and the department feels that the time has come when it is more profitable to expend money on roads connecting the radial routes.

A comprehensive plan has been carefully worked out which will in a few years give Allegheny County an excellent system of economically located and conveniently correlated highways. It will afford through traffic, which has no Pittsburgh stop to make, an opportunity to pass the city without moving through it, thus saving much time which would otherwise be lost in the congested districts. The ability to "by-pass" through traffic is one of the most insistent demands of those interested in national highways today, and the secondary system of Allegheny County is partly intended to fill this need in one locality.

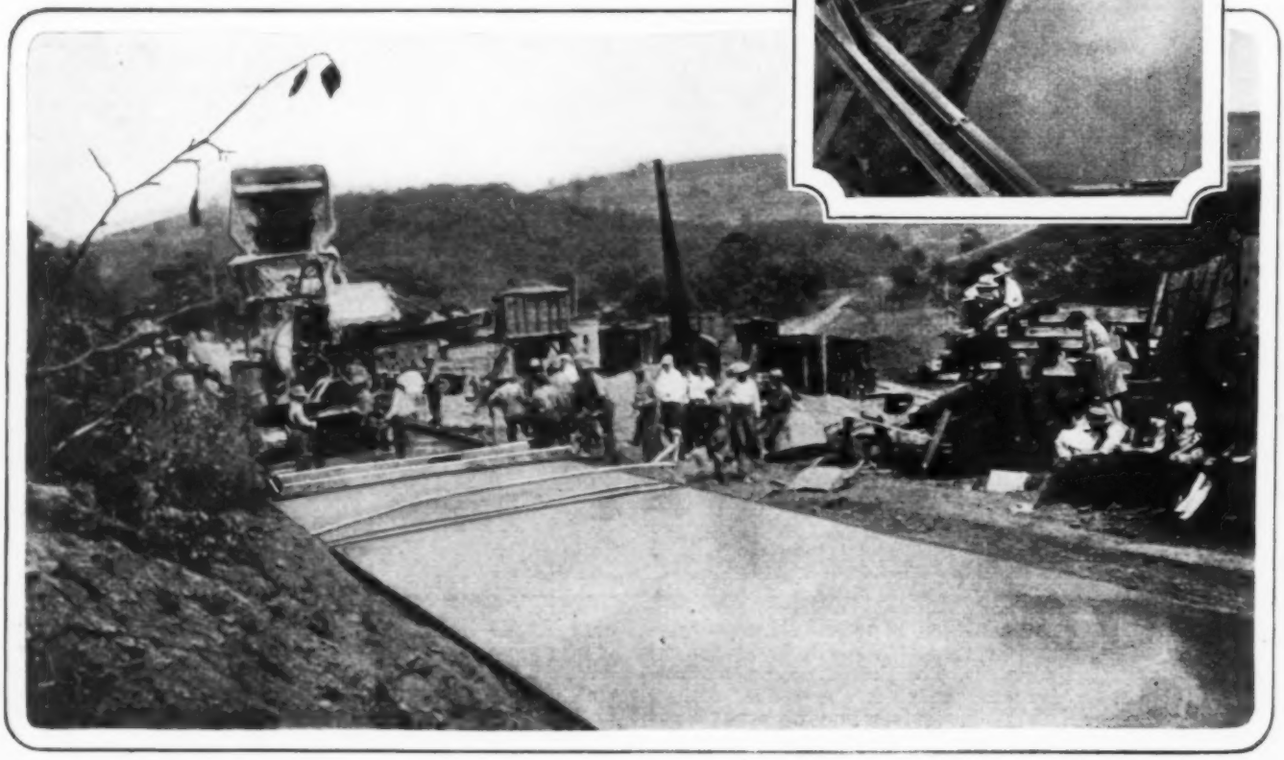
A Compact Concrete Plant

ST. LOUIS UNIVERSITY is to have a new gymnasium and C. W. Schuler & Co. of St. Louis has the contract for building it. The photograph on this page shows the work under way and gives a good idea of how the concrete is handled. The mixer may be seen in the background just behind an Insley steel mast on which the concrete is hoisted to the desired level. In the foreground is the power plant consisting of a Fordson tractor equipped with a Clyde hoist attachment. This is a portable outfit which can be moved in a few minutes. On this job four or five bags of cement have been placed on the front wheels of the tractor to increase the steadiness of the outfit.



In West Virginia

Road builders may soon be charging admission to their jobs if scenes like that at the bottom of this page become more frequent. This 23-mile concrete road job in Roane and Wirt Counties, West Virginia, seems to have attracted a considerable gallery, including a number of members of the fair sex dressed in their best clothes. This job was completed recently by Connell & Laub of Dayton, Ohio. The pictures were sent to *Successful Methods* by S. A. McGrew, an inspector for the State Road Commission, who risked his life to obtain the scene from the top of the paver which appears at the right.



Watertight Box Used to Inundate Sand

A SIMPLE and efficient method of inundating sand before putting it into the concrete mixer has been devised by F. E. Ross, City Engineer, of Jefferson City, Missouri, and has met with success on paving work in that city. A simple water tight box is used, large enough to hold more sand than is needed for each mixer batch. The box is kept full of sand and water and the men wheeling the sand to the mixer load their wheelbarrows from the box of wet sand.

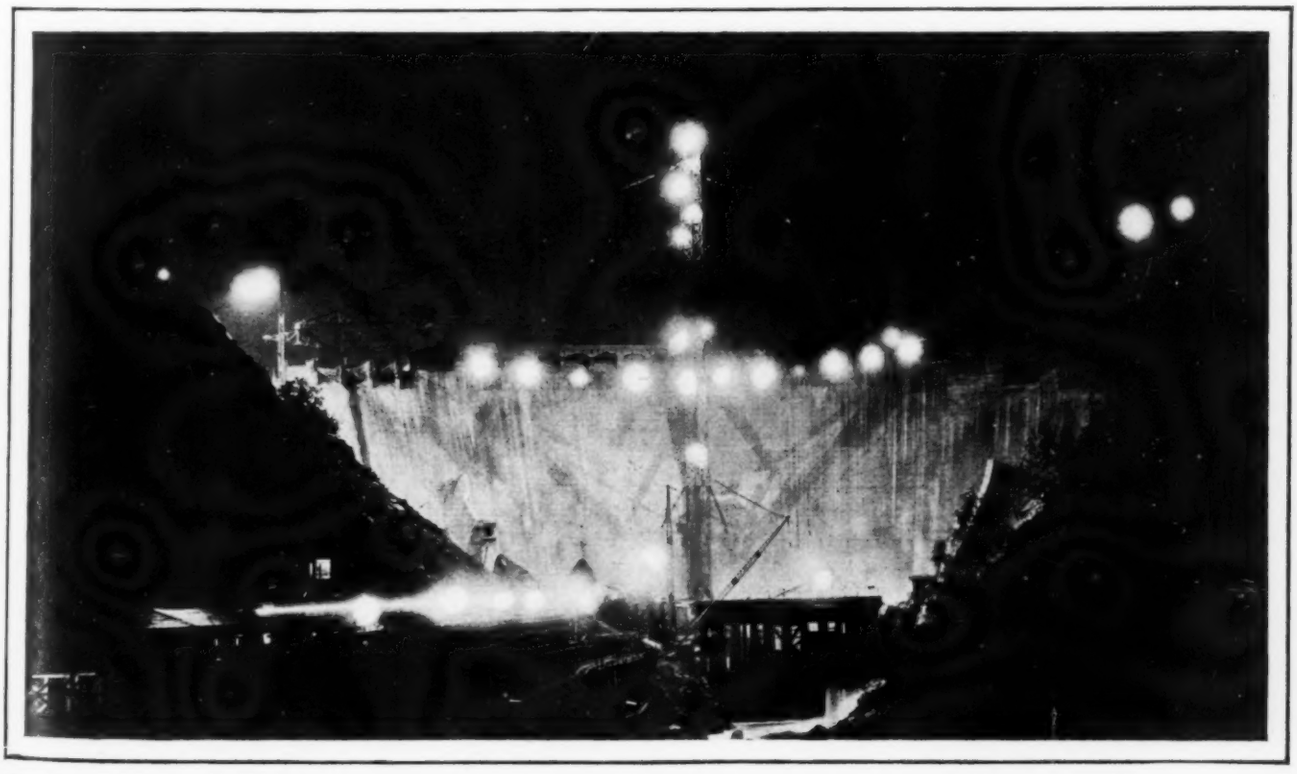
By wetting the sand a uniform mix was obtained as the water in the mixer did not have to be changed after once set. The required amount of sand was ready at all times. The contractor made money over the additional expense of the two men at the box by getting additional yardage with the same amount of cement.

The particular piece of work on which the accompanying photograph was taken was a cement concrete pavement 444 ft. long (one block) and 56 ft. wide. The original pavement was brick on a macadam base. The gutter on the north side was 1 ft. lower than the gutter on the south side and in the old pavement, several places in the center of the pavement were lower than the south gutter. This allowed the water to cross to the north side. The new pavement is a 7-in. plain concrete, 1-2-3 mix, constructed in three sections.

The traffic during construction was between 3,000 and 5,000 cars per day and this traffic was not stopped. This was accomplished by laying the new pavement in three strips, traffic using two of these strips while the third was closed. The contractor who handled the job was Joseph Pope of Jefferson City.

Night Work on the Exchequer Dam

The photograph which appears below shows night work in progress on the Exchequer Dam in the Merced Irrigation District, California, which is being built by Bent Brothers, Inc., of Los Angeles. The great dam has just been finished and even before the final completion was used to generate power. This splendid photograph was taken by Godfrey Mueller who was employed on the dam.

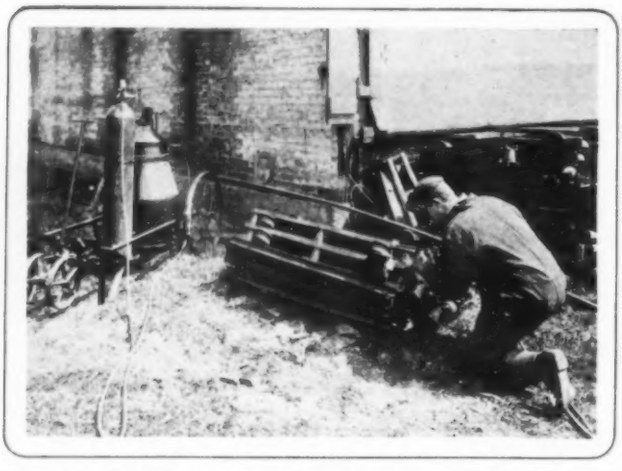


New Equipment On the Job

Generator Passes Hard Tests

A new portable acetylene generator has been developed by the Bastian-Blessing Company of Chicago. This generator has been put through some unusual tests and has passed them all successfully. Its stability was proved by two tests. One wheel of the generator was raised 2 in. without tipping over the fully charged generator. In the second test the front of the truck was raised 66 in. without tipping the generator over backwards.

In addition to this, the generator was started producing gas at 10 lb. pressure and then thrown over on



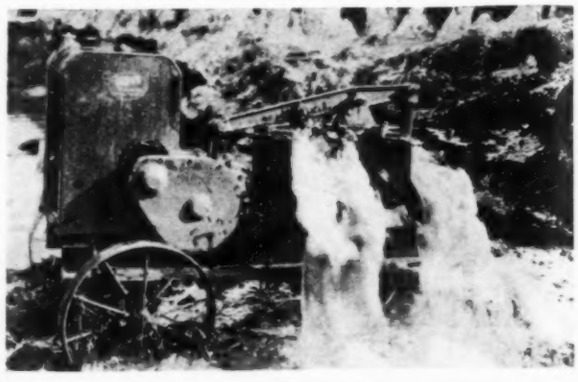
its side. All of the gas and water was expelled through the blow off valves without the slightest damage.

Novo's New Pump

The Novo diaphragm pump shown in the accompanying photograph is owned by the B. & P. Construction Company of Sarasota, Florida, and the photograph was taken on one of that company's jobs. This pumping outfit developed recently by the Novo Engine Company can handle from 16,000 to 20,000 gal. per hour at a total head of 20 ft. The closed top force diaphragm pump similar to the double open top pump shown in the photograph has the same capacity. The total head at which the closed top pump will operate is 50 ft. which makes it possible to lift the water to a distance of 30 ft. above the pump, allowing the usual 20 ft. for suction lift.

The power unit is the UF 3 to 6 hp. 2-cylinder Timken tapered roller bearing engine developed by the Novo company recently. One of the features of the outfit is an inclosed speed reducing unit which makes it possible to reduce engine speed to a slow reciprocating movement.

Another improvement which has been made in the



new pump is the use of live rubber diaphragms which will operate under normal conditions from 150 to 200 hr.

A Curb and Gutter Ditcher

The Barber-Greene Company of Aurora, Ill., has brought out a new curb and gutter ditcher which is shown in the accompanying photograph. The ditcher

in this photograph is owned by Powell Bros. of Chicago and when the picture was taken was excavating for curb and gutter forms near the corner of Robey and Devon Sts., Chicago.

This machine will cut a trench 32 in. side and 3 ft. 6 in. deep at the rate of 5 ft. per minute.

McGRAW-HILL PUBLISHING COMPANY, INC., Tenth Ave. at 36th St., New York, N. Y.

JAMES H. McGRAW, President
JAMES H. McGRAW, Jr., Vice-Pres. and Treas.
MALCOLM MUIR, Vice-President
EDWARD J. MEHREN, Vice-President
MASON BRITTON, Vice-President
EDGAR KOBAK, Vice-President
C. H. THOMPSON, Secretary.

WASHINGTON, Colorado Building
CHICAGO, 7 S. Dearborn Street
PHILADELPHIA, 16th and Parkway
CLEVELAND, Guardian Building
ST. LOUIS, Star Building
SAN FRANCISCO, 883 Mission Street
LONDON, 6 Bouverie St., London, E. C. 4

Cable Address: "Machinist, N. Y."

Publishers of

Engineering News-Record — American Machinist
Power — Chemical and Metallurgical Engineering
Coal Age — Engineering and Mining Journal
Radio Retailing — Ingeniería Internacional
Bus Transportation — Electric Railway Journal
Electrical World — Electrical Merchandising
Industrial Engineer — Successful Methods
Journal of Electricity
(Published in San Francisco)
American Machinist—European Edition
(Published in London)

Subscription is two years for $1 to the United States, Canada, Mexico, Alaska, Hawaii, the Philippines, Porto Rico, Canal Zone, Cuba, Honduras, Nicaragua, Peru, Colombia, Bolivia, Chile, Dominican Republic, Panama, El Salvador, Argentina, Brazil, Spain, Uruguay, Costa Rica, Ecuador, Guatemala, Haiti and Paraguay. Extra postage to other countries, $1 (total $2 or 9s. 4d.) for two years. Single copy, 5 cents.

Change of Address—When change of address is ordered the new and the old address must be given. Printed in U. S. A. Copyright, 1926, by McGraw-Hill Publishing Company, Inc. Published monthly.